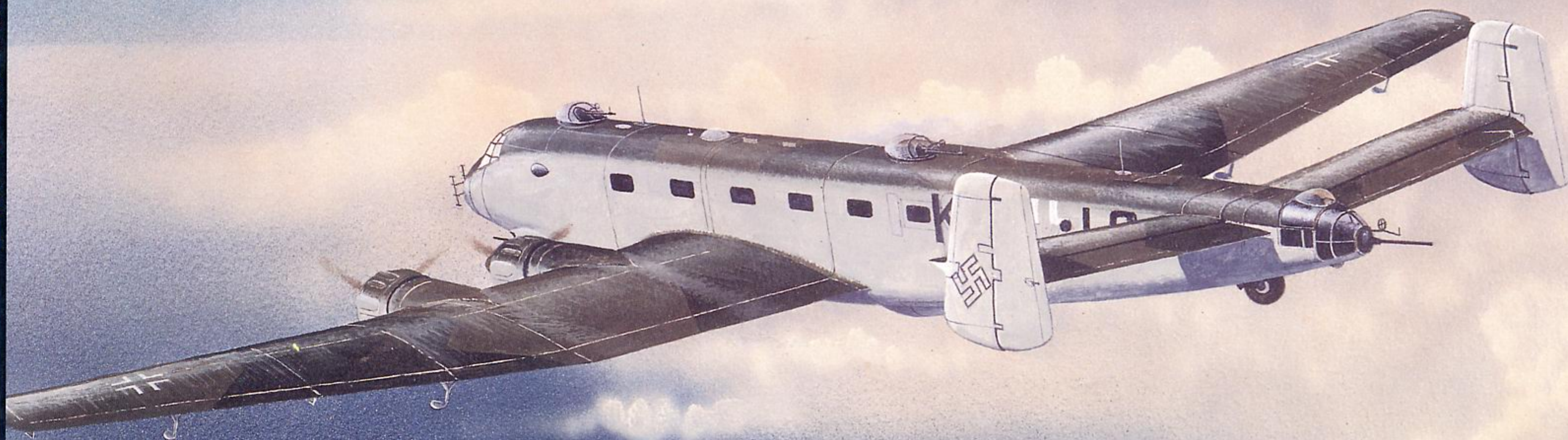


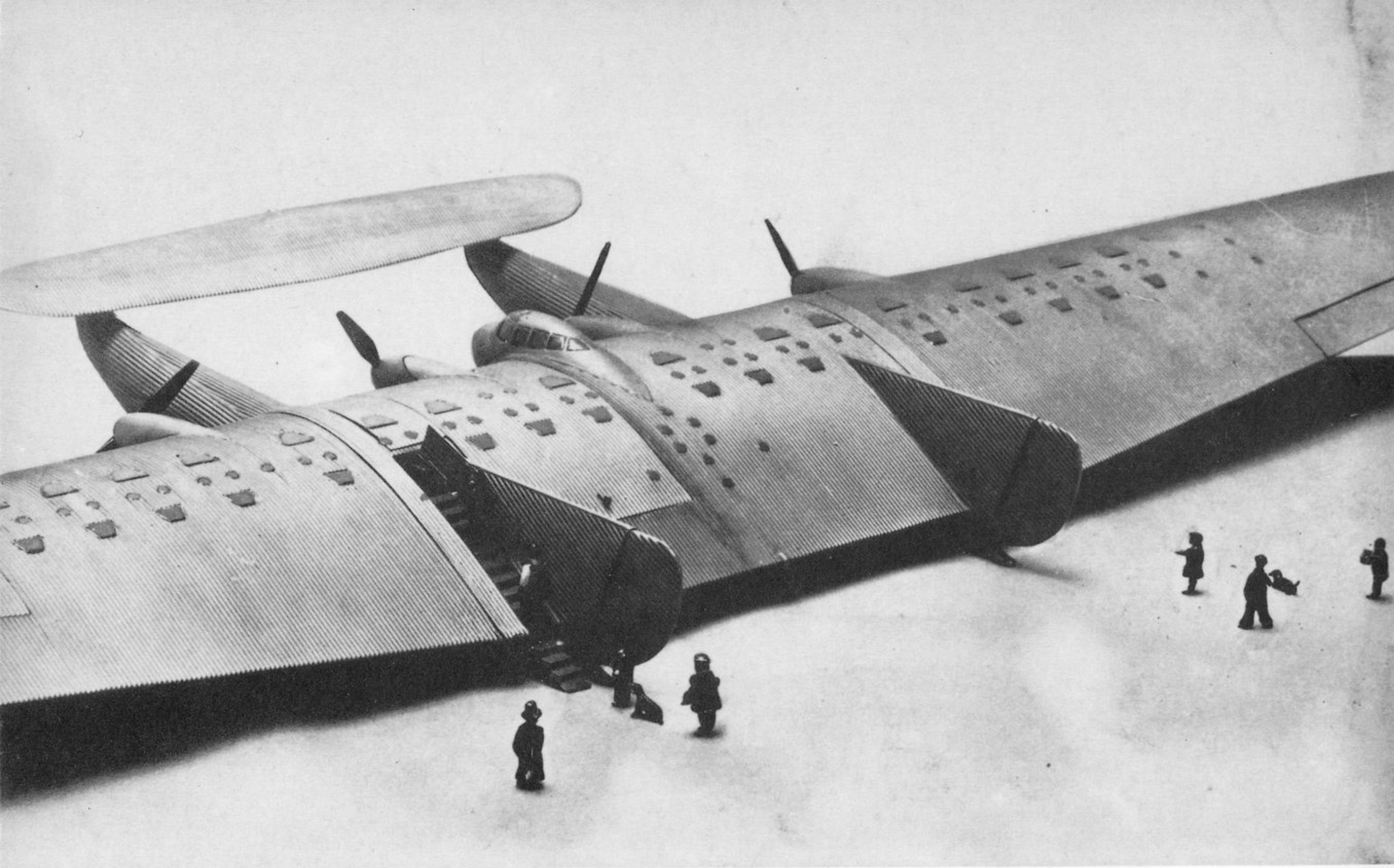
JUNKERS

# Ju 290, Ju 390 etc.

Heinz J. Nowarra







*The Junkers J. 1000. A project for a flying wing, all passengers and cargo would have been carried in the wing areas.*

*Front cover: A Ju 290 A-3 of Fernaufklärungsgruppe 5 monitoring an Allied convoy.*

# JUNKERS

Ju 290 - Ju 390 etc.

Heinz J. Nowarra

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Schiffer Military History  
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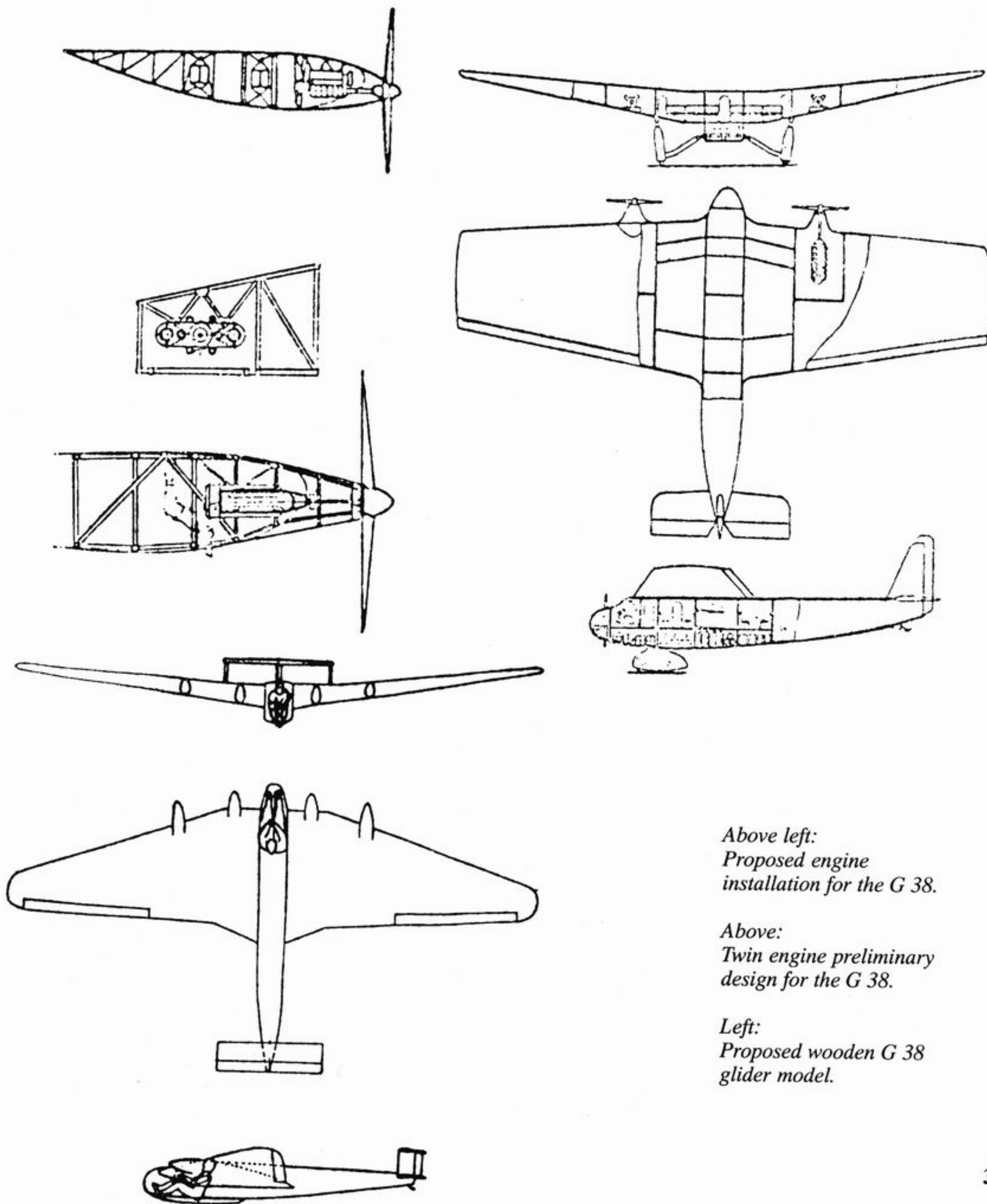
*Two Junkers Ju 90 B-1s of the Deutsche Lufthansa at Berlin's Tempelhof Airport in 1939.*



# Development and Operations of the Ju G 38

In 1910 a certain Professor Hugo Junkers, who had been making a name for himself as a heating technician, submitted a patent for a large-capacity flying wing design, for which he duly received patent number 253 788. This massive airplane was to have incorporated all lifting and control surfaces and cargo area into its wings. By the First World War the R I and R II had been drawn up, designs which made partial use of this construction principle.

After the war's end the JG-1 was built in Dessau, but had to be destroyed on the orders of the victorious Allies. A couple of years later Professor Junkers unveiled the J.1000 model, a design which incorporated his ideas to the fullest degree. It was never produced, however. In the mid 1920s the first draft for the G 38 prototype appeared. The machine was to have had two engines, trapezoidal wings and a standard tail surface layout. This design was revamped several times. Comprehensive testing using wind tunnel models and with smaller aircraft as component testbeds eventually led to an overhaul in the design, resulting in a four-engine layout with new wings which partially included a portion of the cabin and engines. Professor Mader, Professor Madelung and Dipl.Ing. Zindel then worked on building it together. Professor Madelung even wanted to produce a reduced scale flying model out of wood, testing it both as a glider and towed behind another airplane. But since Junkers had no experience whatsoever in the area of wood construction, the idea was dropped.

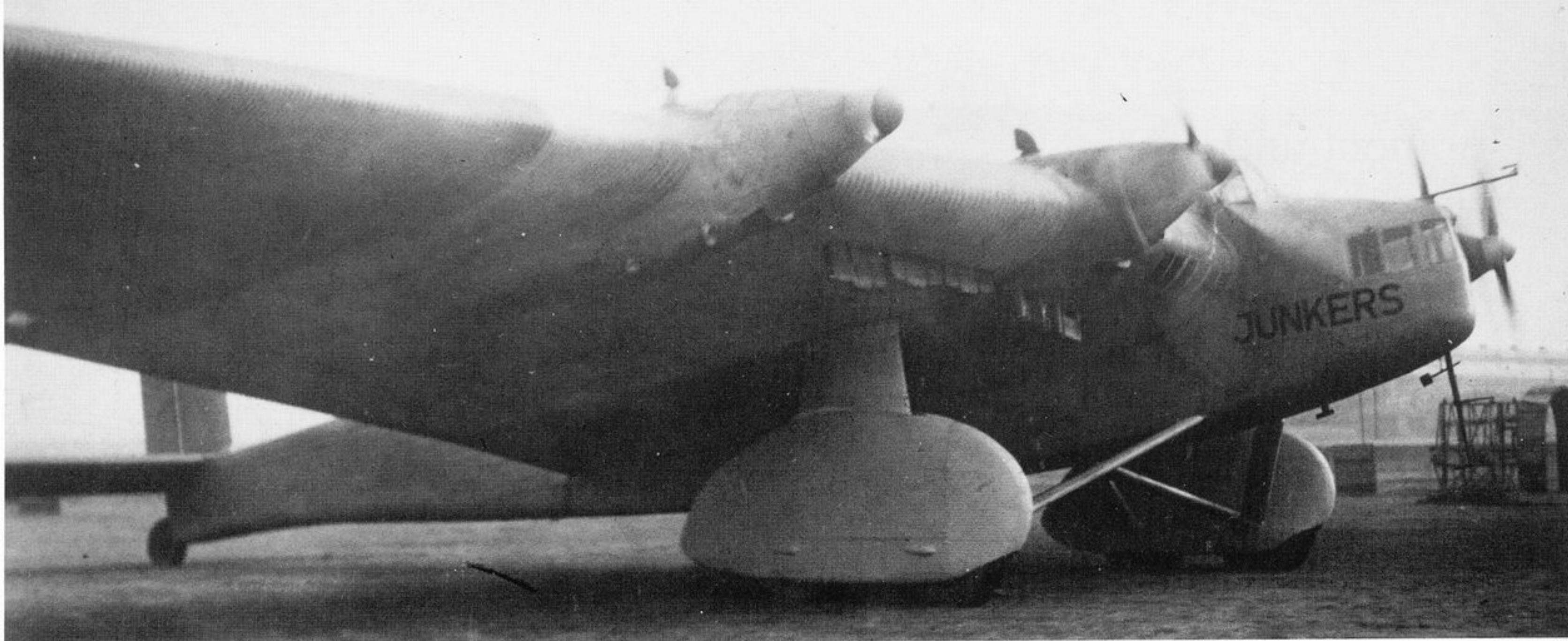


*Above left:  
Proposed engine  
installation for the G 38.*

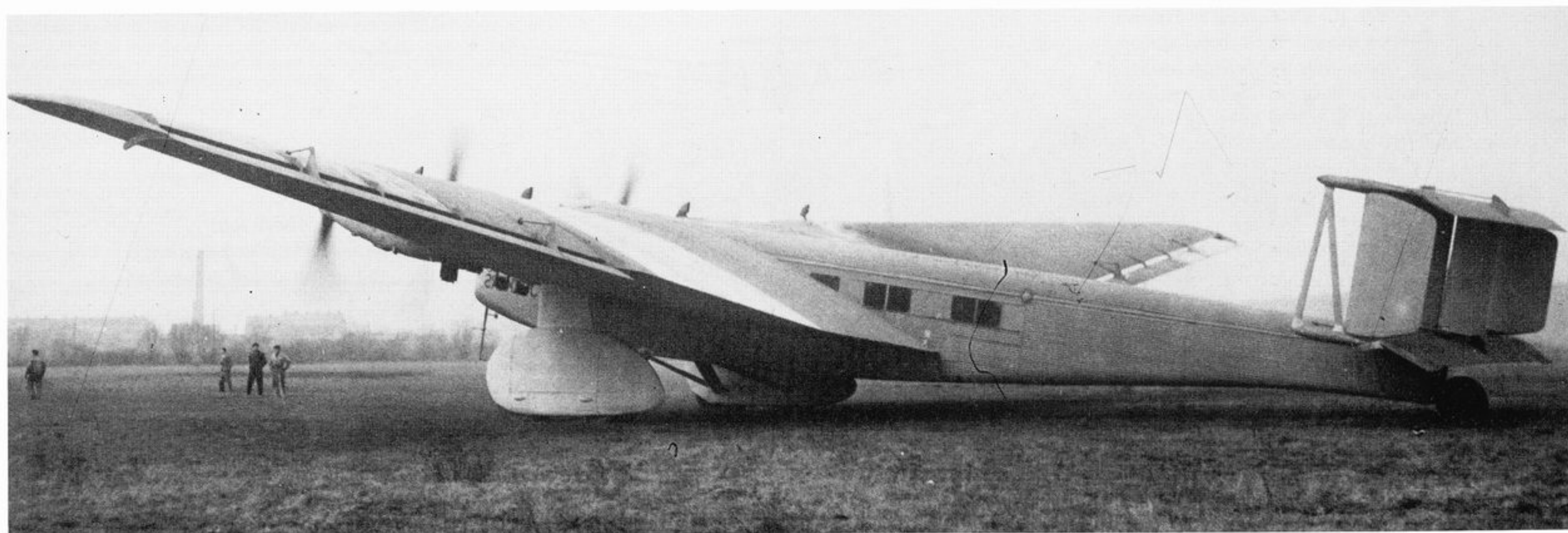
*Above:  
Twin engine preliminary  
design for the G 38.*

*Left:  
Proposed wooden G 38  
glider model.*





*The first G 38 in its original form, shortly before taking off on its maiden flight in Dessau, 6 November 1929.*

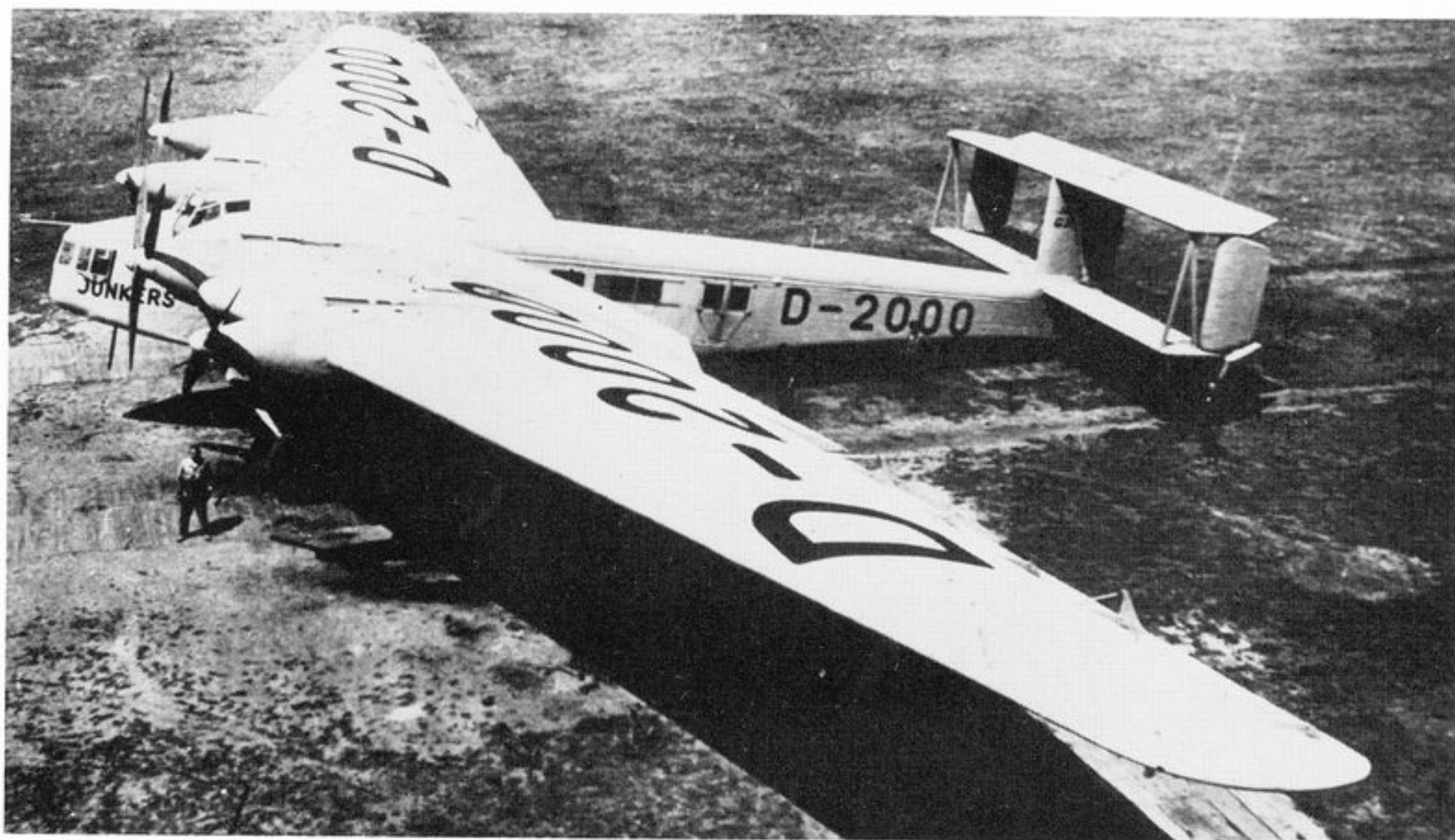




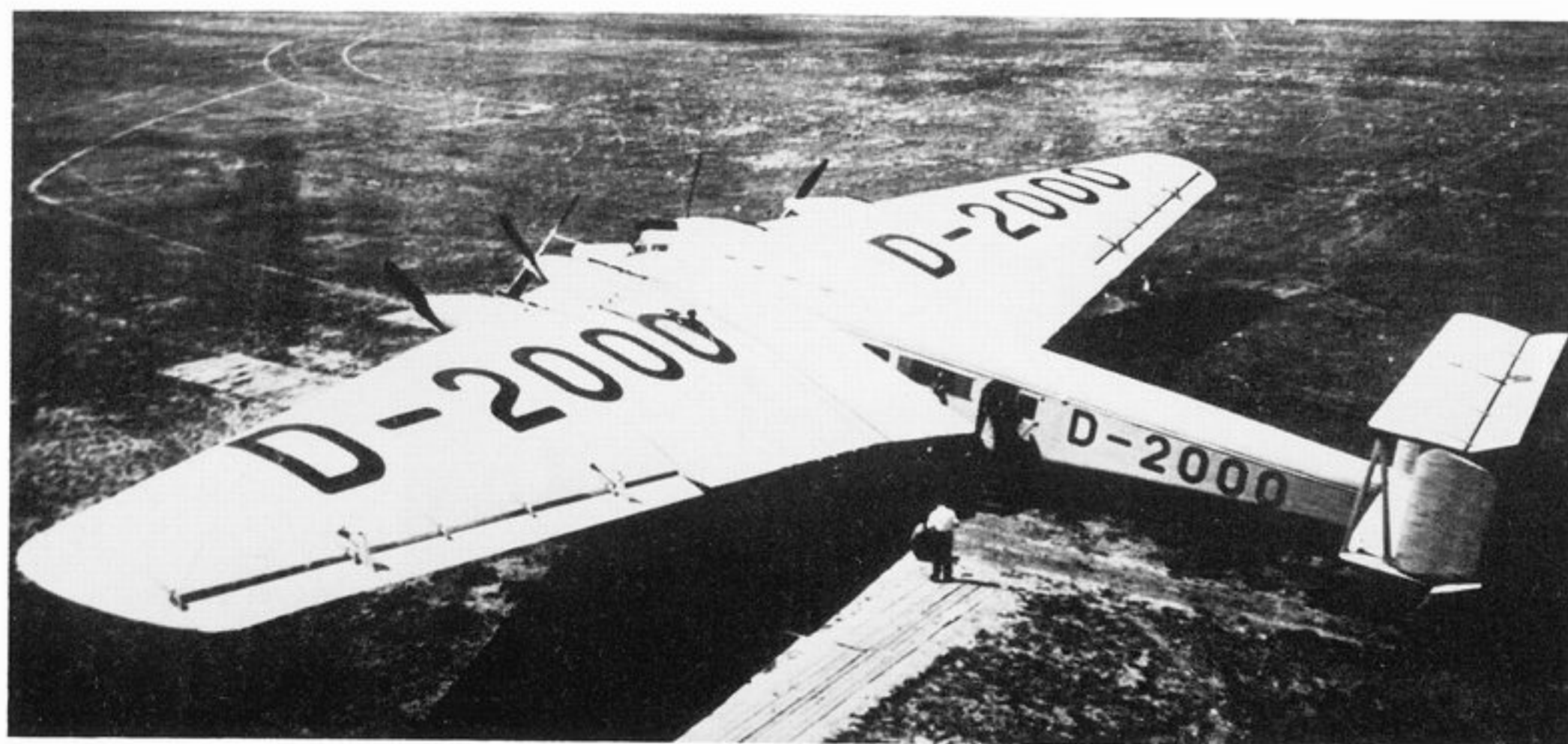
During this developmental period, which was followed by the construction period, the director of the Deutsche Lufthansa (which was to receive the G 38) at the time, Erhard Milch, submitted the name of a man to the position of director of state construction supervisor, a name which was to remain associated with the development of Junkers heavy transports from that point on until 1945. This was pilot Otto Brauer, who had been heavily involved in Lufthansa's development of multi-engined aircraft since 1927 and, on 11 January 1929, had completed over 500,000 kilometers in the air. The director of the Air Department of what was then the Reichsverkehrsministerium (Transportation Ministry), Min. Dir. Brandenburg, named Brauer as director of construction supervision at the Junkers Flugzeugwerk AG with the task of carrying out supervision, construction and testing of the Junkers G 38. In 1933 Brauer was acquired by the Reichsluftfahrtministerium (RLM, Air Ministry), became an officer and over the course of time eventually rose to the rank of Major in the reserves.

In November 1941 the Generalluftzeugmeister named him as director of supervision and construction of the Ju 252, 352, 290 and 390 heavy transports. He remained at this post until the end of the war, was taken prisoner by the Soviets and wasn't repatriated until 4 July 1948. Until his death a few years ago he remained a loyal friend of the author.

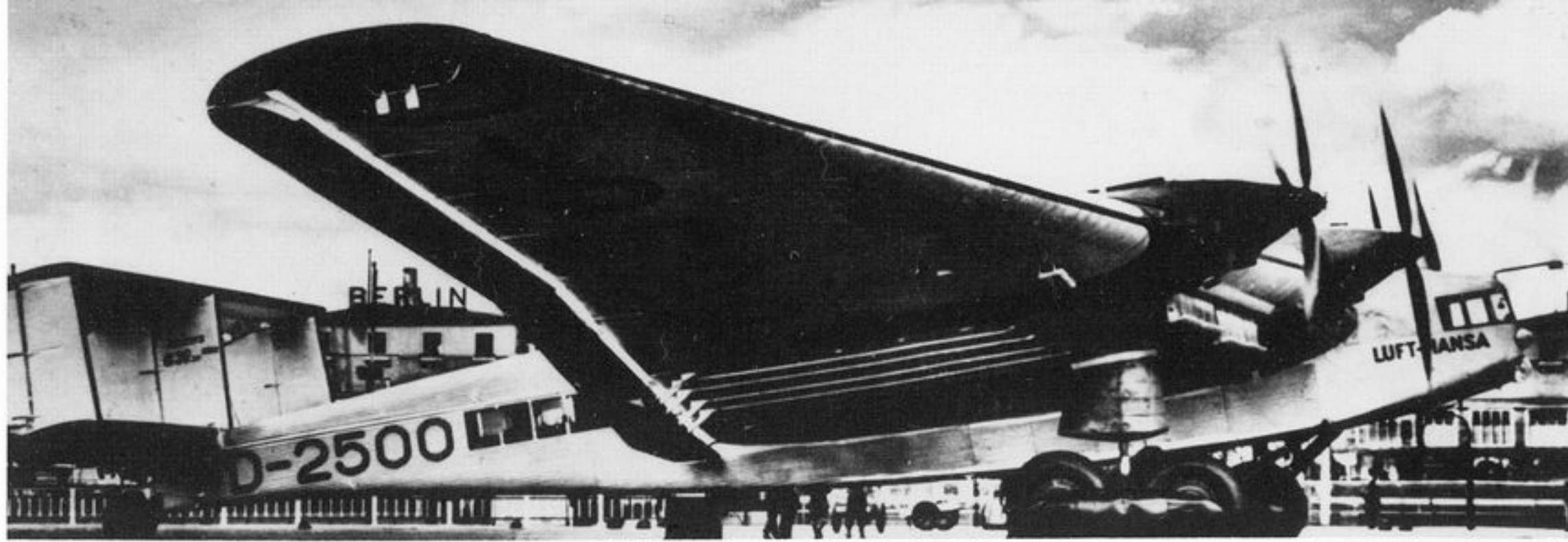
When installing the powerplants into the G 38's wings, it became necessary to locate the engines themselves almost halfway along the wing chord, driving the propellers by means of extended shafts broken by spur wheel reduction gearing. The fuselage cross-section was so small that it virtually blended into the wing profile. Power was provided by two Junkers L 88a (each with 775 hp) for the inner engines and two Junkers L 8a (each with 325 hp) for the outer engines. Fuel was carried in 28 individual tanks within two compartments housed in the centerwing section. Crew consisted of seven men.



*Once flight testing had been completed the first G 38 was registered with the code D-2000. It wasn't until 1933 that it was given the registration D-AZUR.*







The first G 38, assigned registration code D-2000, took off on its first flight on 6 November 1929 with pilot Brauer at the controls. It was revealed during testing that the landing gear covers were an obstruction during takeoff and landing. These were accordingly removed, whereupon it was discovered that only a minimal loss in speed resulted from the exposed landing gear. The instrument layout was based on input from Brauer.

The evaluation program lasted until 26 May 1931. The second pilot to fly the D-2000 was Zimmermann, who conducted the factory acceptance flight. By this time a second G 38 was under construction and it was discovered that in only a short time the G 38 had become a favorite of its passengers. The first flights to London and Paris resulted in an unusually high demand for seats on this airplane.

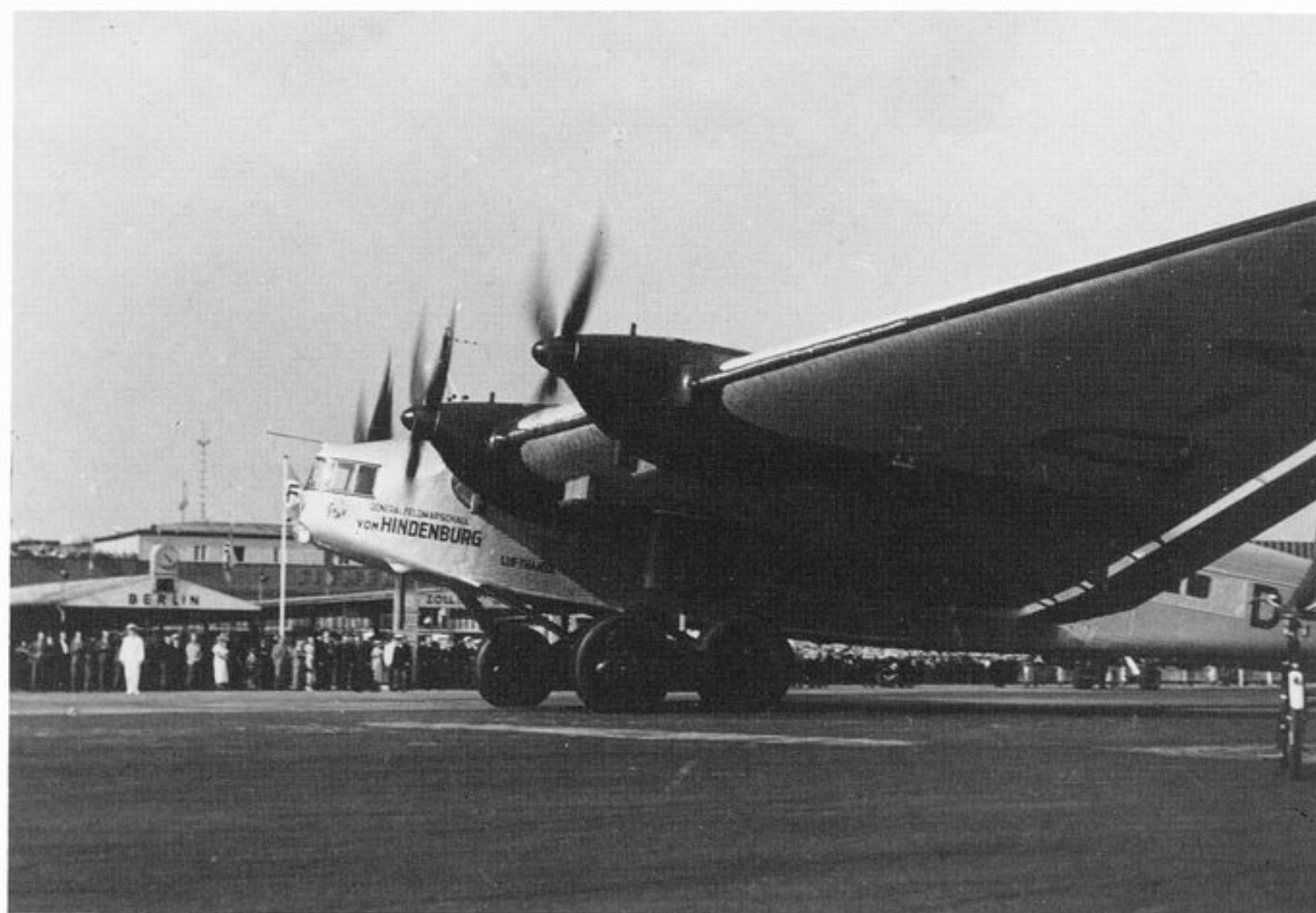


*Above: The second G 38, D-2500 (later to become D-APIS).*

*Below: Christening the D-2500 in the name of Reichspräsident Hindenburg. Shown in the photo are (l.to r.) Reichswehrminister von Blomberg, DLH director Wronsky, DLH director Milch, the Reichspräsident, captain Brauer (holding picture).*

*Right: Captain Brauer with passengers, posing in front of D-AZUR.*





*Above: G 38 D-APIS after the christening ceremony.*

*Above right: D-APIS on landing at Tempelhof.*

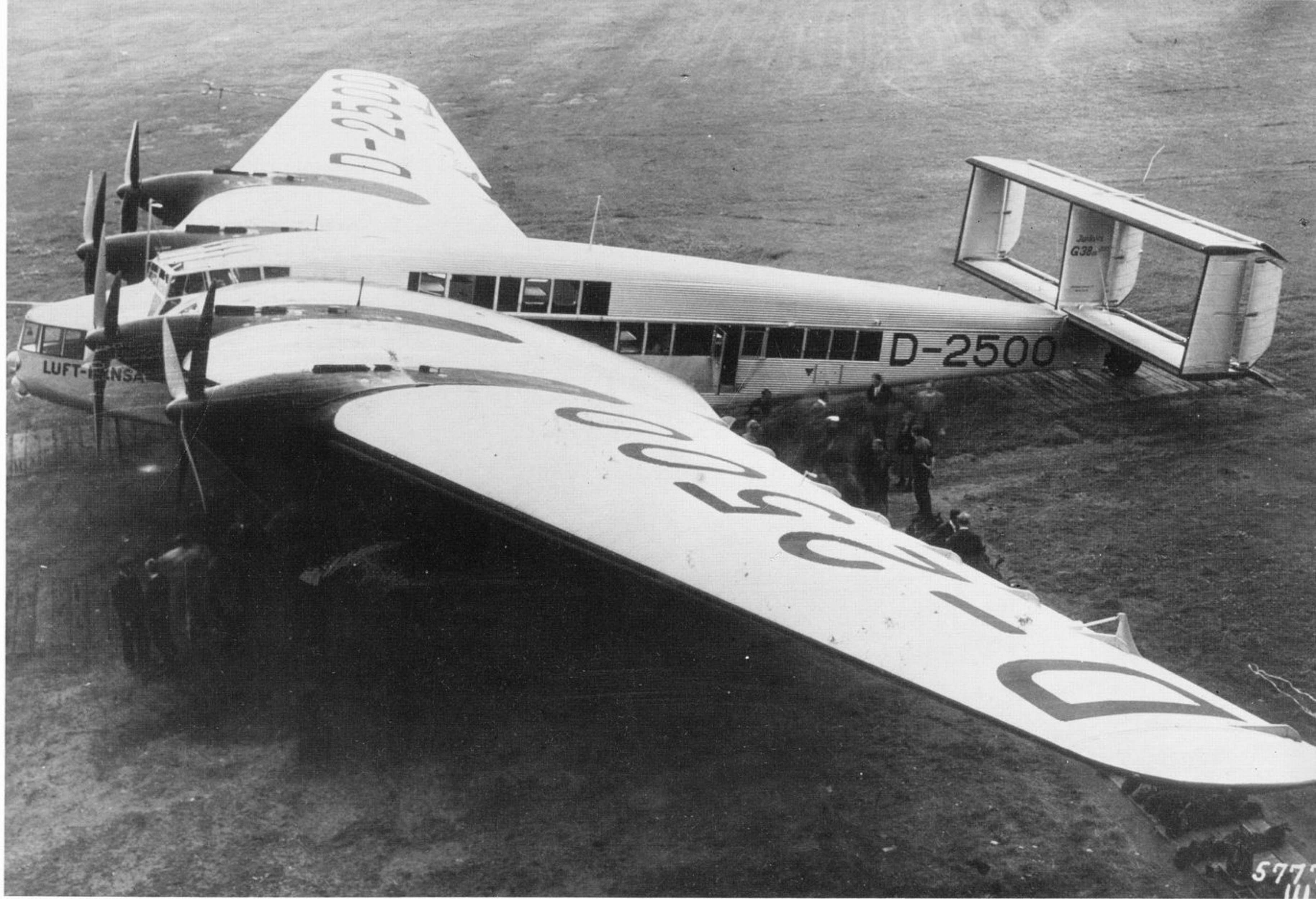
*Right: D-APIS taxis out for takeoff.*





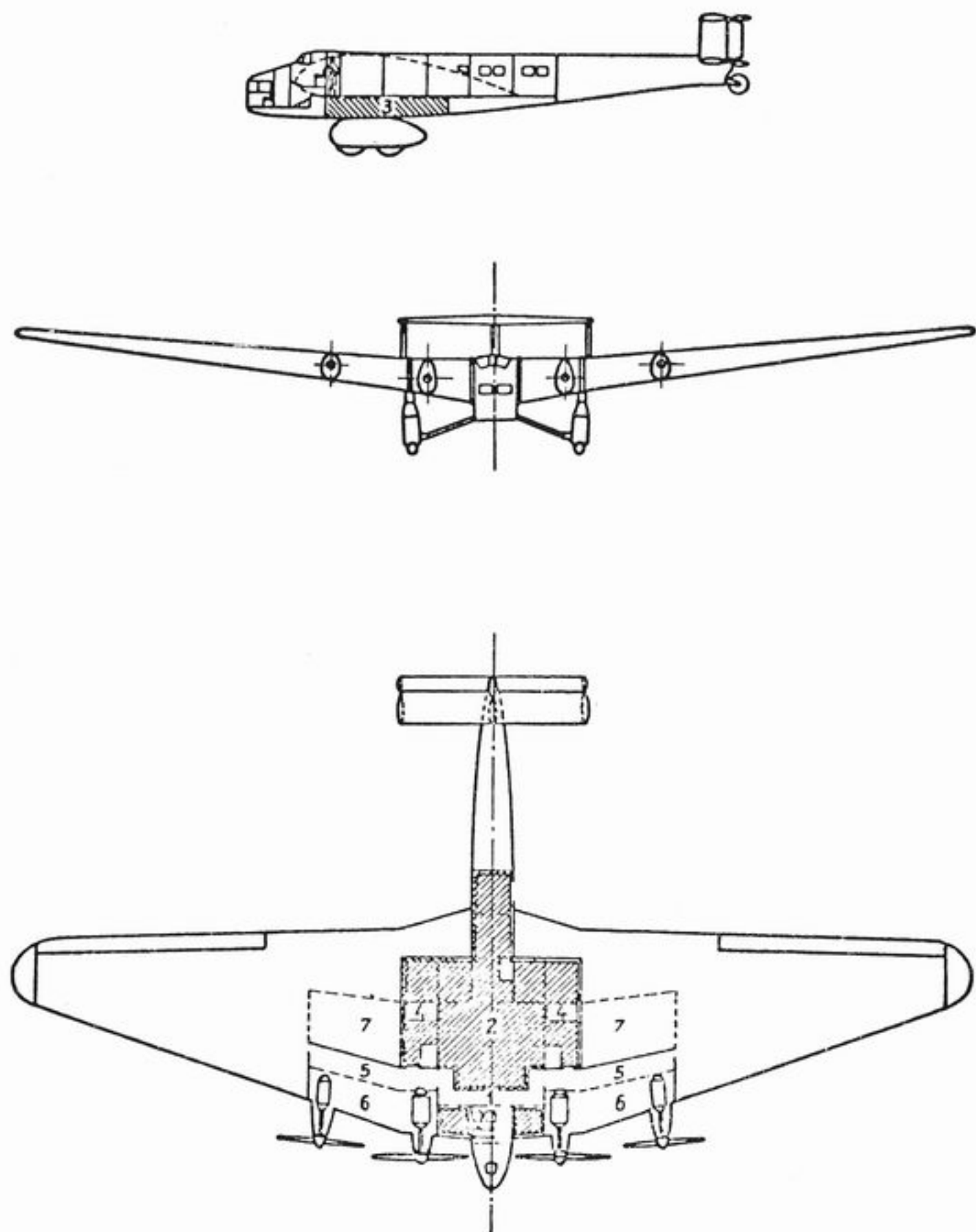
*With the G 38, Lufthansa had the largest commercial landplane in the world at the time. The aircraft was first employed on the Berlin-London route from 1 July 1931.*





*Unlike D-2000, D-2500 (D-APIS) utilized diesel engines, had a two-story fuselage and tailfins.*





1 Bedienungszentrale 2 Fluggast- und Frachtraum 3 Frachtraum 4 Ladeluken  
5 Betriebsgänge 6 Maschinenräume 7 Tankräume

*Above: Factory drawings of the Ju G 38.*

*Above right: Major Otto Brauer takes a music platoon on board enroute to Oslo.*

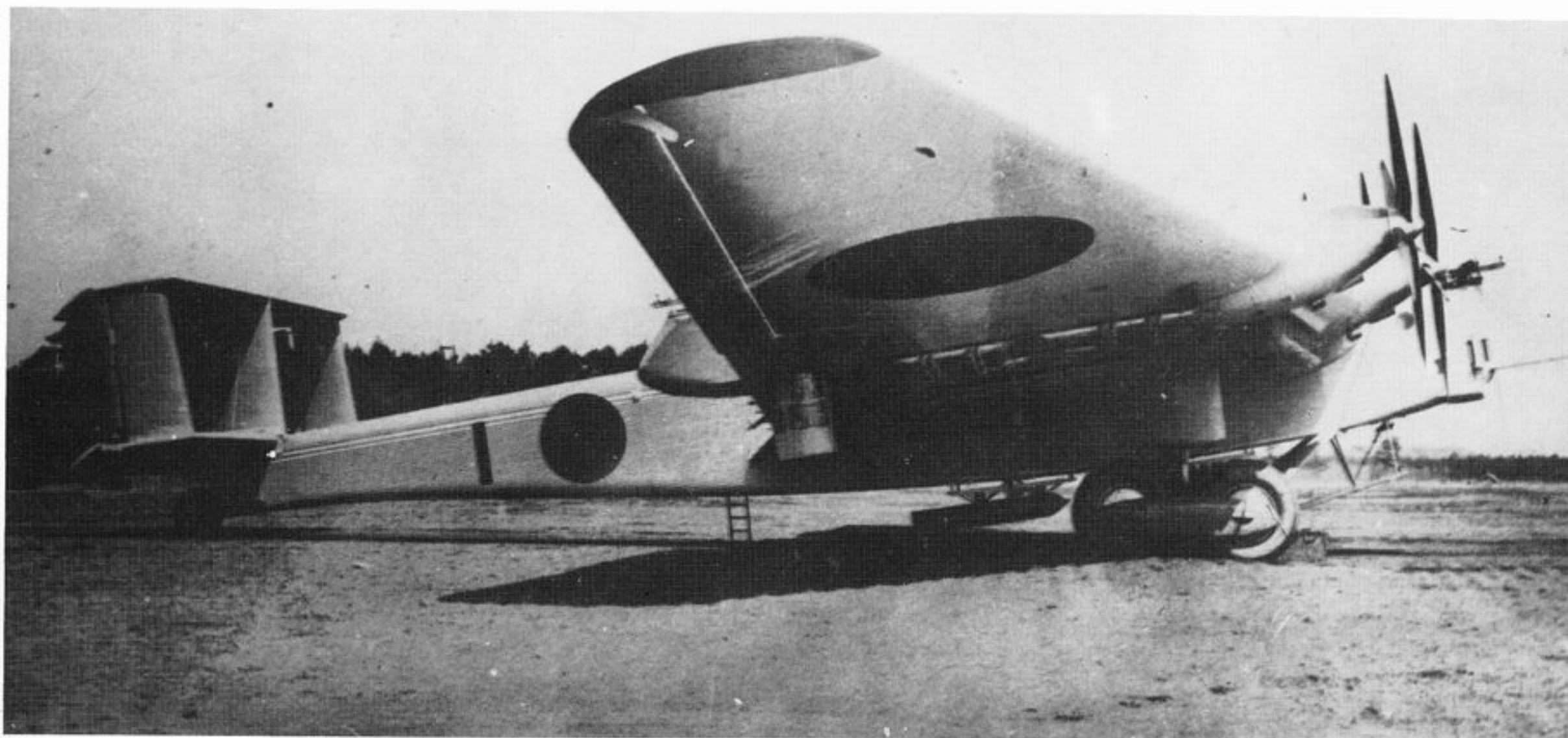
*Below: D-APIS with its new Luftwaffe markings of GF+GG in Le Bourget (1940).*



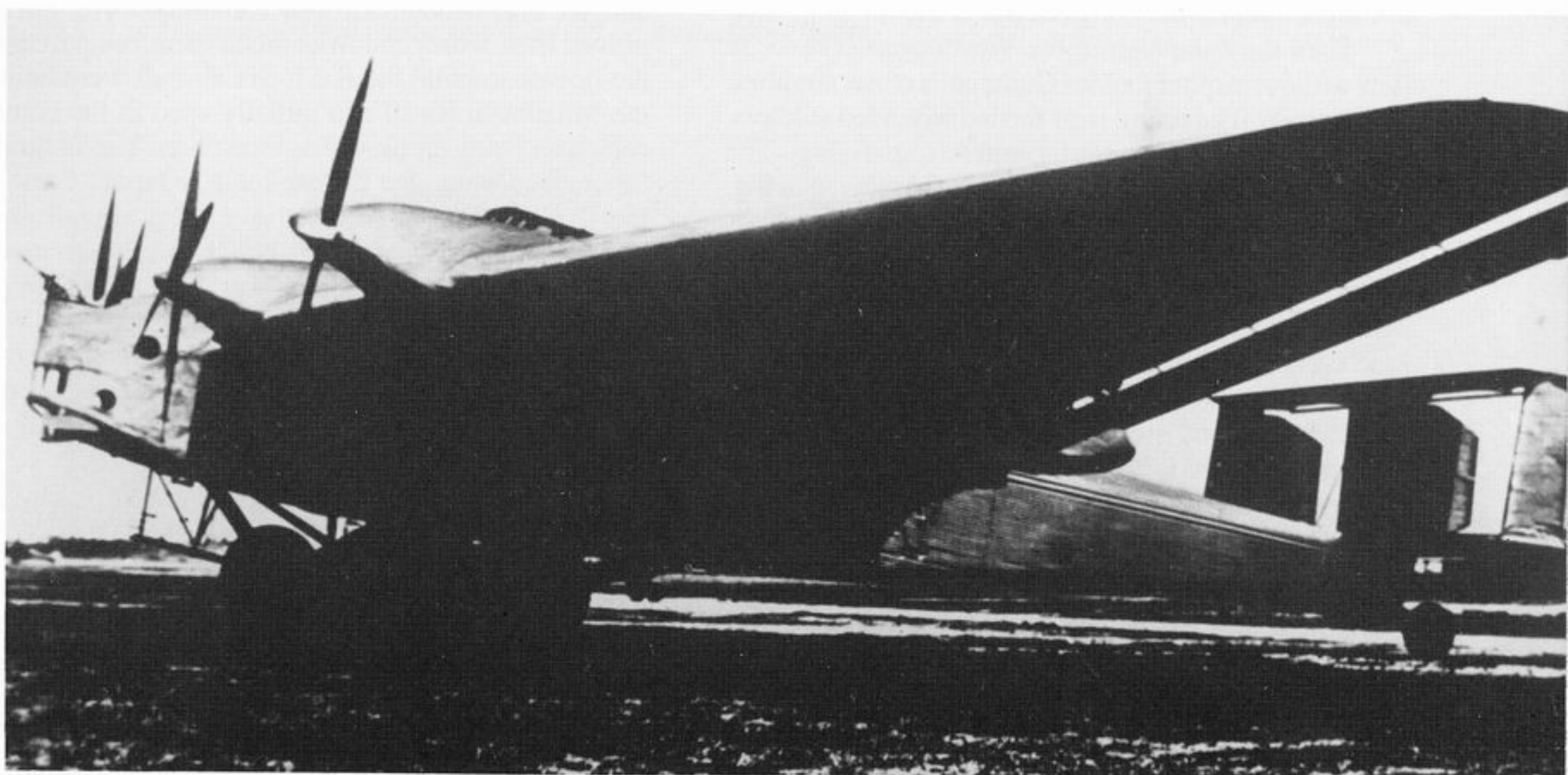


The second G 38 was registered as D-2500, and differed considerably from its predecessor. More comfortable seating was created for a significantly larger number of passengers by raising the height of the fuselage section behind the wings and lengthening the passenger compartment to the rear as well as a more practical use of space within the compartment itself. At the same time D-2500 was fitted with damping surfaces and Junkers external airfoil flaps along the entire trailing edges of the wings. Powerplants were initially the 800 hp Junkers L 88, but these were later replaced by diesel Jumo 204 engines with an output of 750 hp each. In addition to the crew of seven, the aircraft could also carry 34 passengers, 26 in the wing and fuselage cabins, six in the observation areas in the wing leading edges and two in the nose of the fuselage. Its diesel engines gave this G 38 a distinctive sound, which made it recognizable even before the aircraft came into view. After 1933 both G 38s were given new registration codes: D-2000 became D-AZUR and D-2500 became D-APIS. The latter was christened "Generalfeldmarschall von Hindenburg" in 1933 at Berlin Tempelhof in the presence of the Reichspräsident.

An unfortunate incident occurred in 1936. During routine maintenance of D-AZUR a control cable was connected improperly. This resulted in captain Zimmermann, through no fault of his own, crashing D-AZUR. Although there were no deaths as a result, the machine was a total write-off. Only D-APIS survived, which captain Brauer continued to fly regularly. By 1937 it had logged 3,240 flying hours. On 1 December 1934 Brauer became a "Lufthansa millionaire", a title given to all flight captains who had flown a million kilometers. On 1 September 1935 he became an Oberleutnant in the Luftwaffe reserves and on 17 August 1939 celebrated his 25th anniversary as a pilot.



*The Mitsubishi Ki 20 was the Japanese version of the Junkers K 51 heavy bomber (a conversion of the G 38).*





Nine days later, just five days before the breakout of the Second World War, he was inducted into the Luftwaffe as a Hauptmann along with his D-APIS. Since Brauer was nearly two meters tall and weighed over 100 kilograms, the opinion within the Luftwaffe was that the G 38 had only been built to afford his figure a suitable aircraft.

The large capacity aircraft which the Luftwaffe had seized when the war broke out were formed into a special squadron with Kampfgeschwader z.b.V. 172, to be used in emergency situations for delivering supplies. After a few missions within the RLM and with Luftflotten 3 and 4, Brauer and his G 38 finally undertook their first front-line mission. On 9 April 1940, with the beginning of Operation Weserübung and the occupation of Denmark and Norway, Brauer and his G 38 repeatedly flew equipment, supplies and ammunition into Oslo-Fornebu. His most unique cargo was an Army music platoon. At his request the musicians played during the entire flight. They presented their first concert in Fornebu under the wings of the G 38.

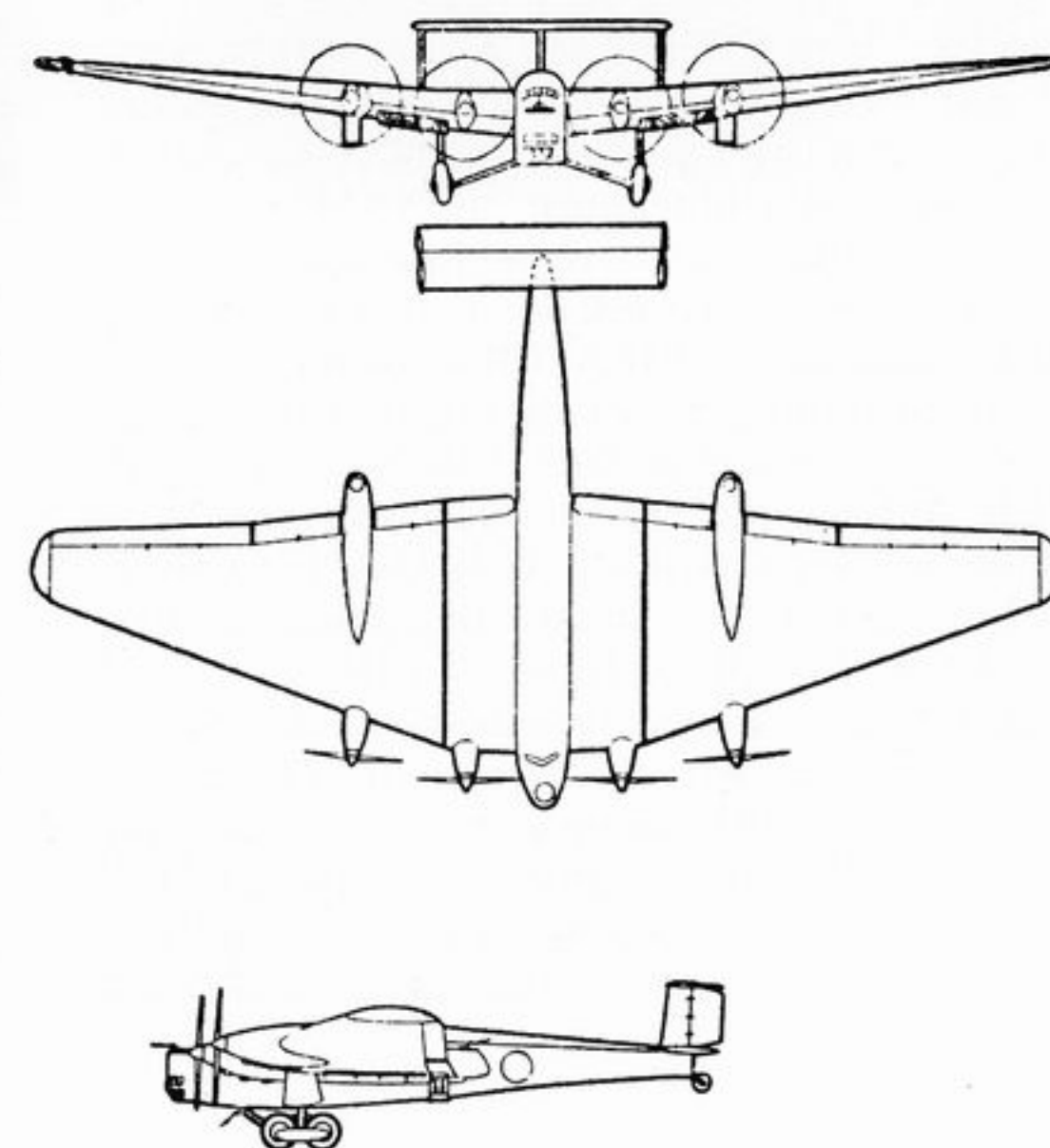
Then the campaign in the West began. The G 38 flew without respite: fuel for Guderian's tanks, supplies, ammunition. The return trips ferried wounded soldiers. Even fog couldn't prevent Brauer from flying. The airport at Rhein-Main in Frankfurt was blanketed in fog, but Brauer knew his machine. The four corner towers of the airship hall jutted up out of the ground fog, and Bauer used these to orient himself. He was able to calculate precisely where and in what direction he could land his aircraft with its 44 meter wingspan. Once Paris was in German hands, the G 38, which by now was camouflaged and registered as GF+GG, became a frequent visitor to Le Bourget. Even after the cease fire agreement in Compiegne on 22 June 1940, it often flew between the Reich territory and Le Bourget.

In early April 1941 preparations began for the Balkans campaign. Here, too, the G 38 was brought in. These were to be its last flights. It flew every type of cargo imaginable, and wounded soldiers were ever joyful when they were quickly returned to hospitals back home to recover. During the ongoing airborne assault

of Crete, provisions fell in short supply for the VIII Fliegerkorps. General von Richthofen ordered Brauer to "get bread now!" The G 38 roared off. A few hours later it had returned to Athens-Phaleron: the bread was still warm!

But time was rapidly running out for the G 38, an aircraft type which was fundamentally a failed concept. The flying wing idea of Professor Junkers continued ad absurdum with the development of new large capacity transports. This didn't change the fact that the two G 38s were the first real large capacity transports in the world. At the end of May, 1941, British fighter-bombers caught D-APIS on the ground at Athens-Phaleron and destroyed it with bombs and guns.

By 1933 it was common for Junkers to build most of its models in both a civilian and military version. For example, the G 24 commercial airliner was also designed as the R 42 bomber. Junkers also used the G 38 to develop a heavy bomber, the K 51. In Japan the Junkers S 36/K37 was built under license as the Ki 1 and Ki 2 at Mitsubishi and Kawasaki. The aircraft proved their worth and Mitsubishi therefore purchased the license to build the K 51. Six aircraft were built as the Mitsubishi Ki 20 and initially used in the bomber role, later being employed as transports. The Junkers L 88 engines were also license-built in Japan. Crew for the Ki 20 consisted of eight men. The aircraft could carry a bomb load of 5,000 kg. Defensive armament included a 2 cm cannon in a nose turret, one 7.7 mm machine gun in weapons gondolas under the wing trailing edges and one 7.7 mm machine gun in an open gunner's position located on both of the wings' upper trailing edges. The last of these aircraft were still flying as late as 1943.



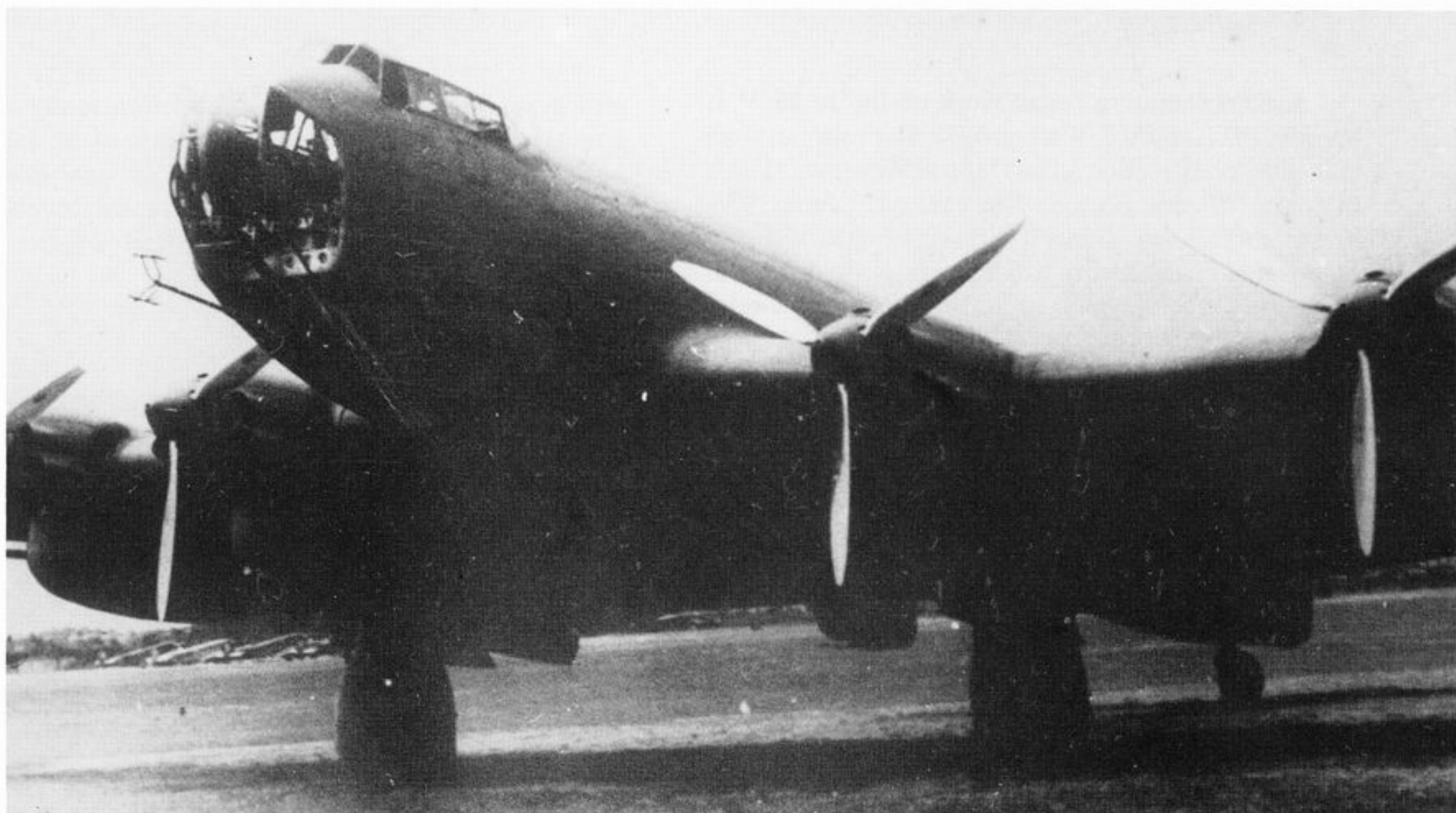
*Three-view drawing of the Mitsubishi Ki 20.*



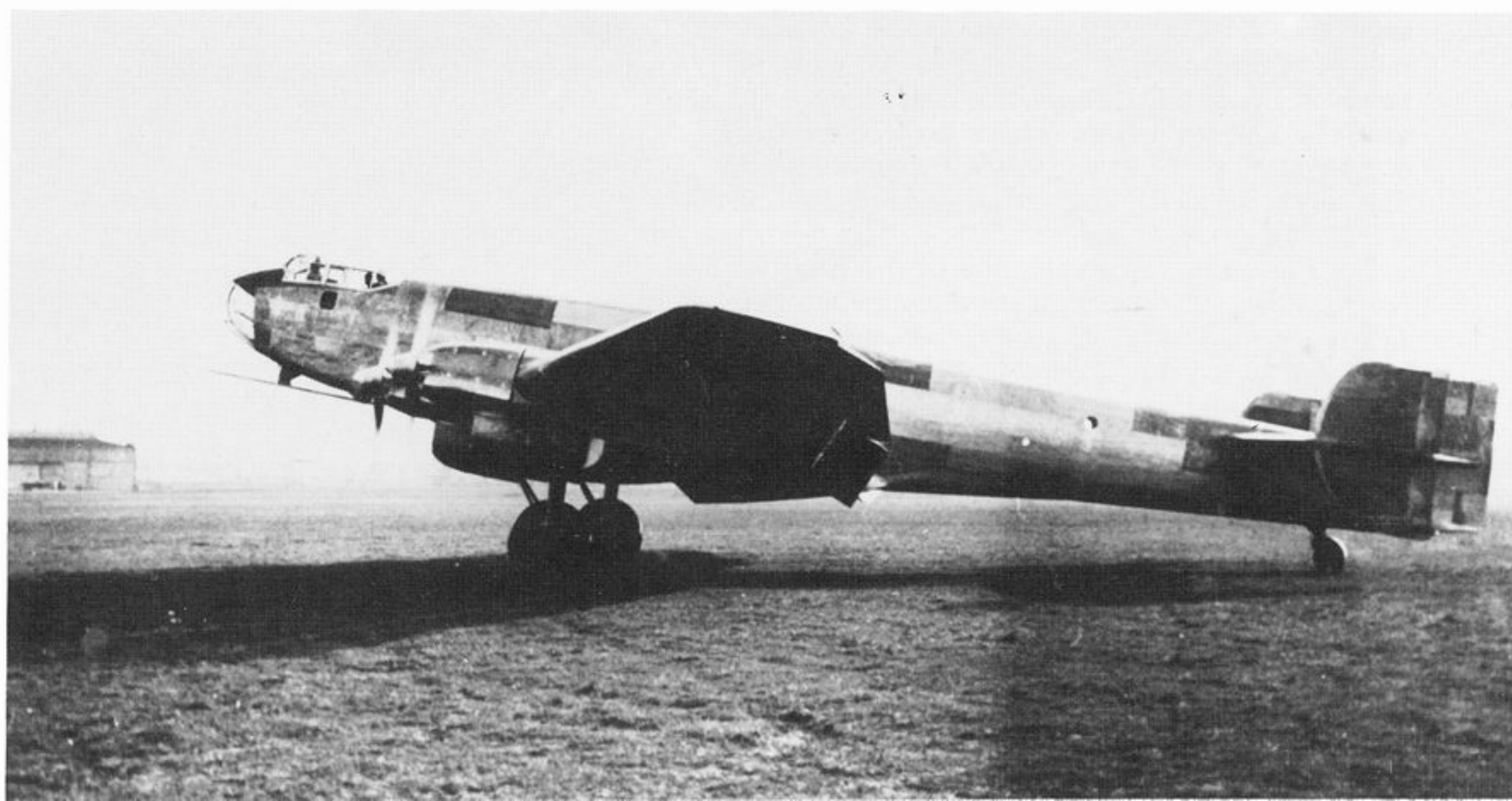
# Development of the Ju 89

In 1935, after Germany publicly revealed its new Luftwaffe which had been rebuilt in secret, the chief of the Luftkommando-Amt (as the Generalstab der Luftwaffe was then known), General Walther Wever, called for the buildup of a strategic bomber fleet consisting of four-engined bombers. He was following the ideas of the Italian General Douhet, who envisioned the decisive role that heavy bomber armadas would play in wartime. Such heavy aircraft had up to that point only been built by Dornier and Junkers in Germany. These two companies were accordingly awarded contracts for building two prototypes each.

Dornier laid down a design which was not only reminiscent of the Do 17, but also was probably influenced by the Armstrong-Whitworth AW 23. At Junkers, chief designer Ernst Zindel made use of the Ju 86 as his basis. This was probably an error on his part, for the Ju 86 never found favor with the Luftwaffe. A handicap for both manufacturers was the powerplant, or rather the lack of a reliable high performance engine. Dornier made use of the Bramo 322, which had an output of 715 hp, while Junkers selected the new Daimler-Benz DB 600 A with 960 hp. The Bramo 322, formerly the SAM 22 B had already shown a tendency to vibrate when it was used in Heinkel's He 46. The DB 600 A was soon struck from production in favor of the DB 601. The best choice would have been the new Jumo 211 A with 1,075 hp, but this was just entering production and, in addition, displayed certain weaknesses.



*Ju 89 V 1 in December 1936, prior to taking off on its maiden flight.*





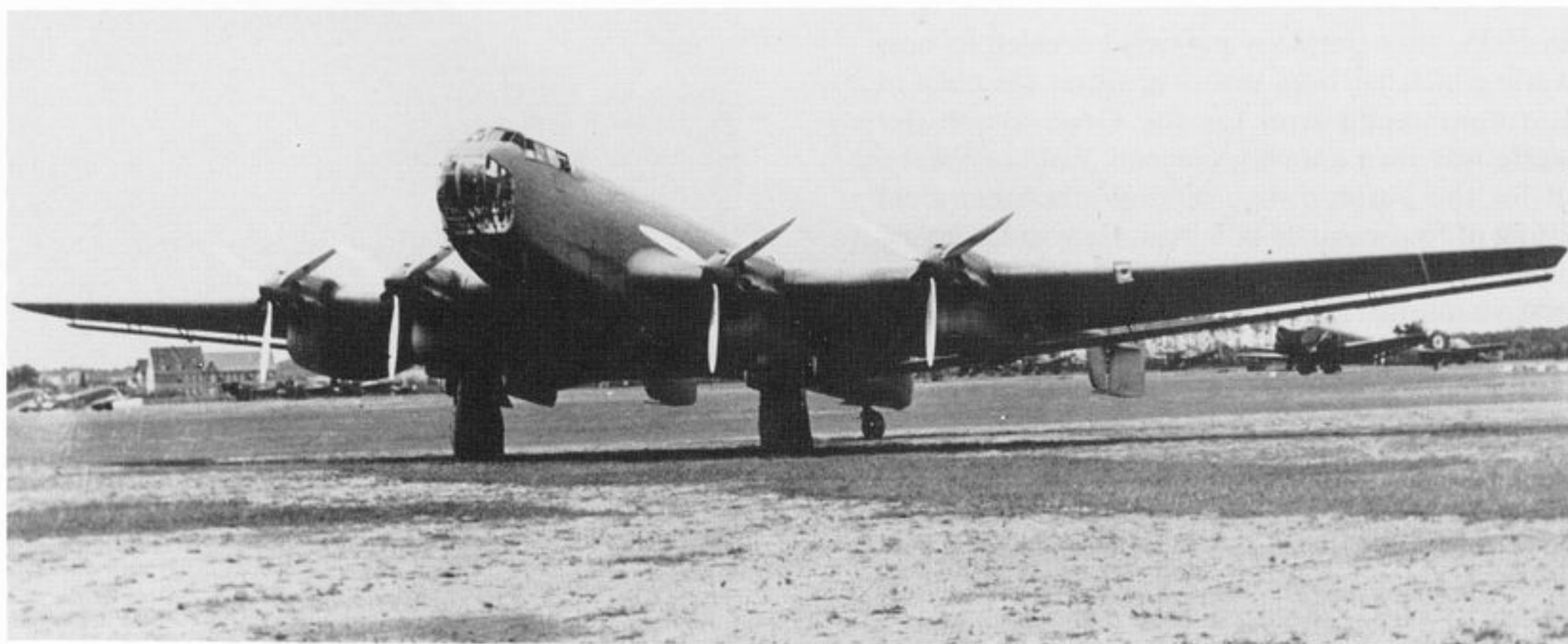
Junkers therefore began work on the Ju 89 V 1, Werknr. 4911, and V 2, Werknr. 4912. Both aircraft were still under construction when General Wever was killed in an He 70 near Dresden-Neustadt on 3 June 1936. Wever's successor, General Kesselring, had virtually no concept of the theory of air warfare. He called for medium bombers, which could be built in the largest numbers in the shortest period of time. He was probably operating under the assumption that the development of new four-engined bombers would have taken too long. And then there was the matter of fuel consumption.

Luftwaffe members after the war claimed that, according to former Generalfeldmarschall Milch, the Do 19 and Ju 89 would have only been able to attain a speed of 290 km/h. This doesn't agree with data provided by the manufacturers: The Do 19 380 km/h, Ju 89 386 km/h. Cruising speed for both was 312 km/h and 310 km/h, respectively. In addition, the Luftwaffe (i.e. Generalluftzeugmeister Udet) required that the bombers be capable of dive bombing. This wasn't entirely unjustified, for the accuracy of Germany's bombers in horizontal profile was not acceptable. The Ju 89 V 1, D-AFIT, took to the air on its maiden flight in December of 1936 with four Jumo 211 As. Other changes were required during testing, including enlarging the tailfin.

In early 1937 the Ju 89 V 2, D-ALAT, was finished and fitted with the DB 600 A. A third Ju 89 was in the initial stages of construction. By November 1936, however, the Luftwaffe's interest in the Ju 89 was vanishing. Zindel was given approval to use components of the Ju 89 V 3 for building a large commercial airliner. Thus, the Ju 90 V 1, D-AALU, was born from the Ju 89 V 3, Werknr. 4913.

In the meantime, evaluation of the first two prototypes continued apace. It was discovered that the Ju 89's performance was comparable with the standard of the day. By installing more powerful engines, which became available one year later, it would have been possible to increase the aircraft's performance even more. A comparison with the Boeing 299 (B-17), a contemporary, reveals that the latter was markedly superior in performance to the Ju 89. Nevertheless, on 29 April 1937 the Ju 89/Do 19 program was red-lined on the orders of Göring. Instead of taking the available

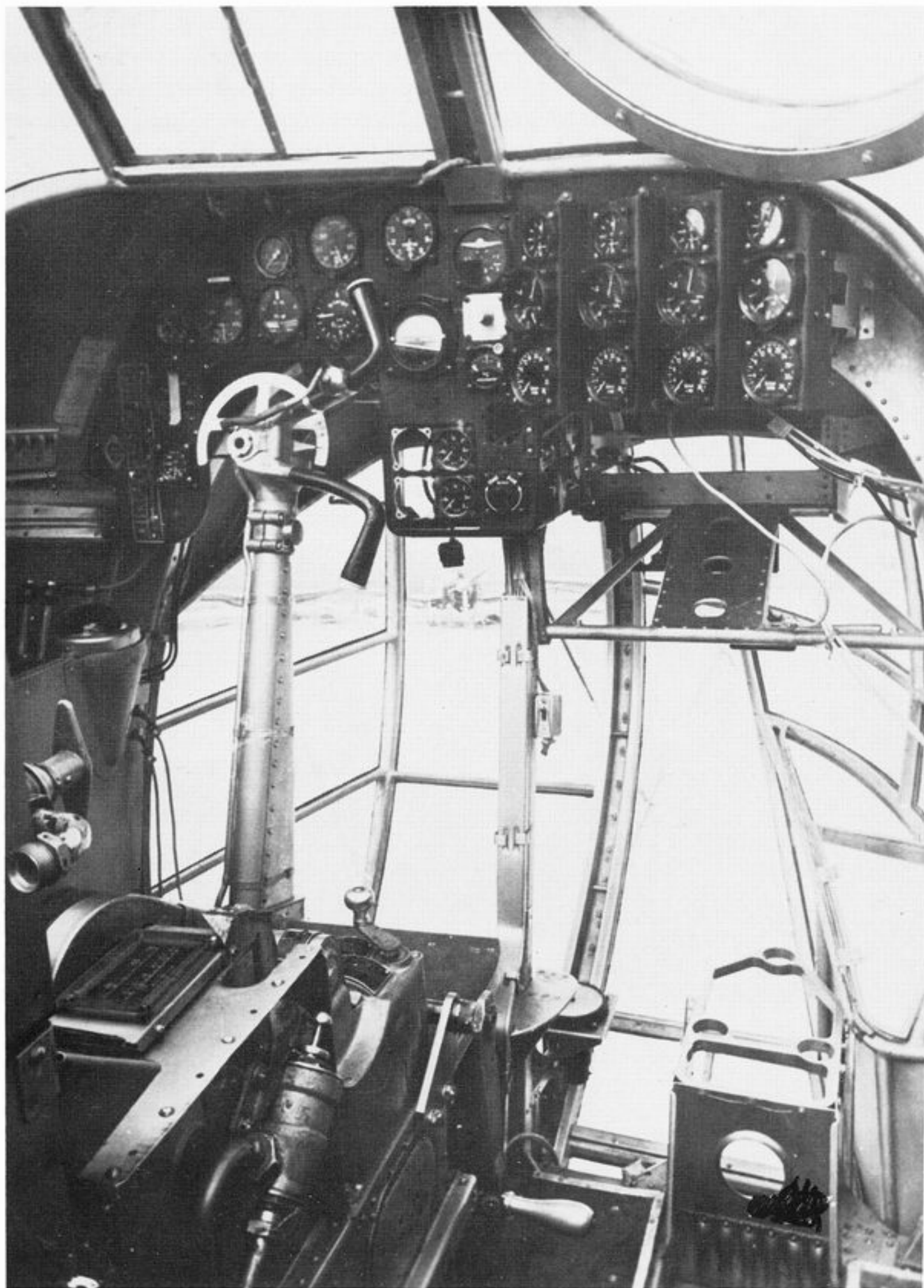
prototypes and making them production ready and operational through the installation of suitable powerplants, development began on a new heavy bomber one which was required to have dive bombing capabilities, a feature which was practically impossible to achieve with the state of technology at the time.



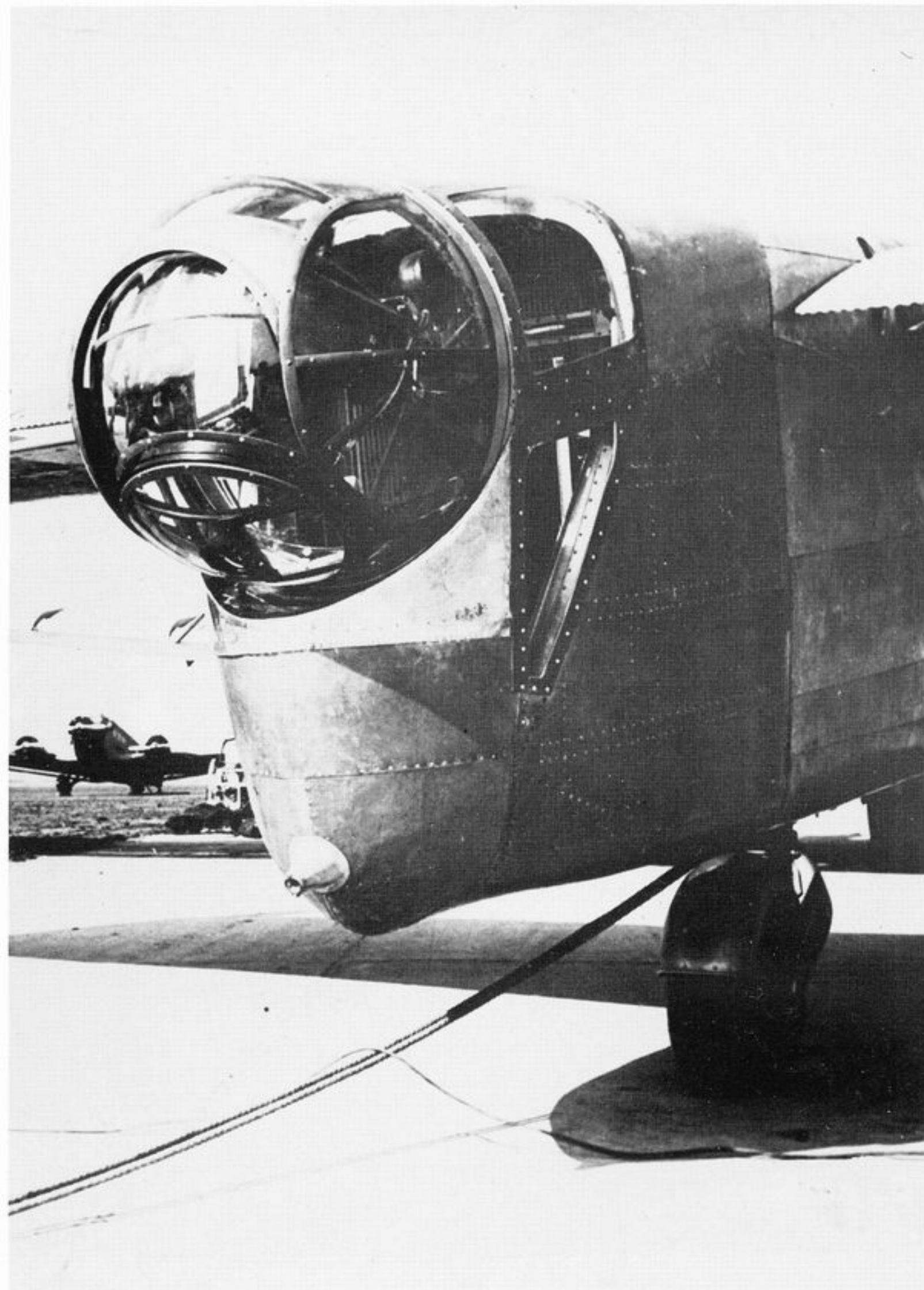
*Ju 89 V 1 in Dessau during flight testing. Similarity with the later commercial airliner is unmistakable.*





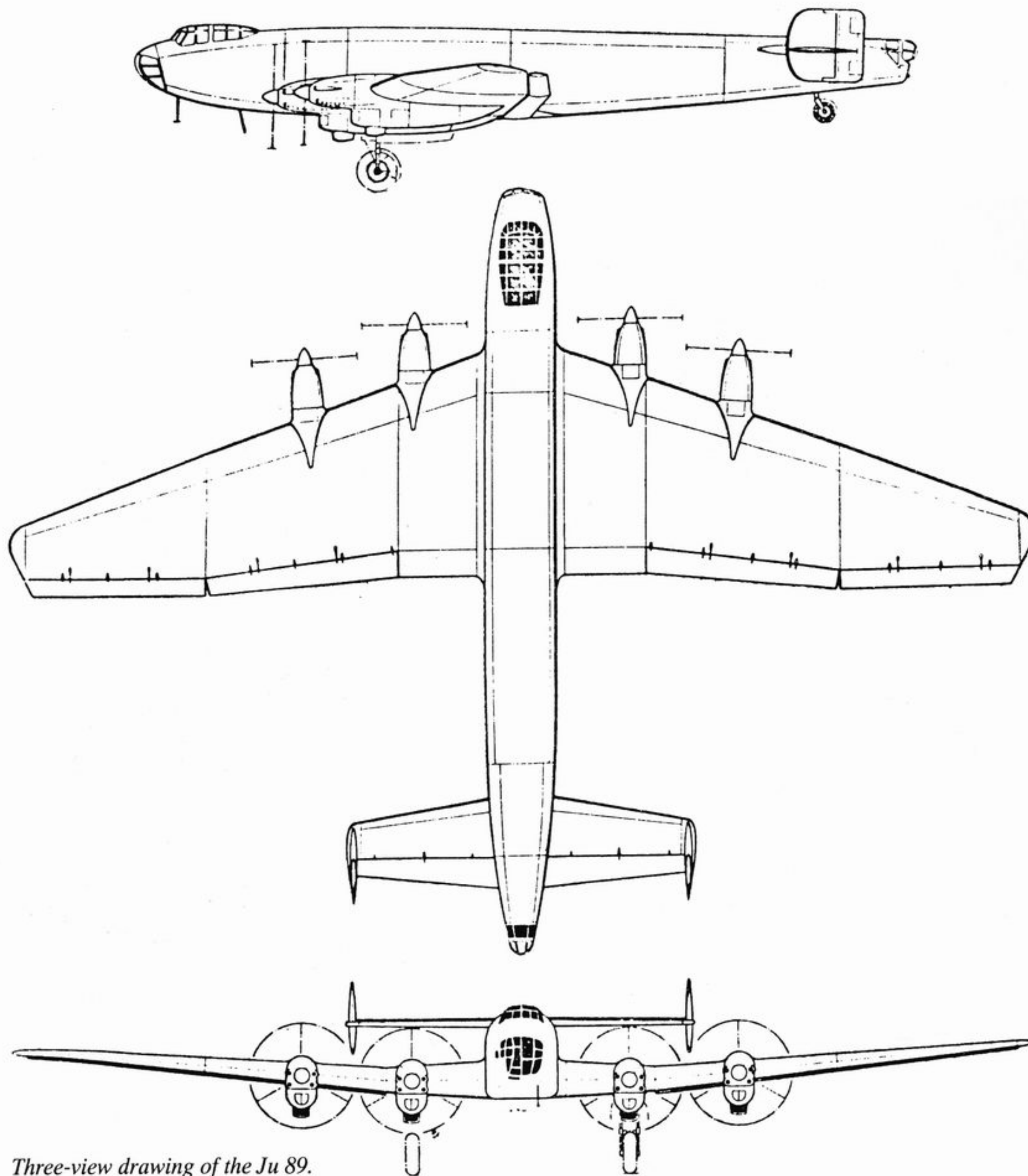


*Pilot's compartment of the Ju 8 with control column and instrument panel.*



*The Ju 89's rear gunner's station was the complete nose gun position from the Ju 86.*





*Three-view drawing of the Ju 89.*

The two Ju 89s were used by Junkers for various testing purposes, particularly in preparation for the Ju 90 program. That these aircraft were high performing was borne out by the fact that Ju 89 V 2 established two world records on 4 and 8 June 1938. This machine reached an altitude of 9,312 meters with a 5,000 kg load and with 10,000 kg 7,242 meters.

After the outbreak of war, both Ju 89s were pressed into service as transports with Kampfgruppe zbV 105 and, along with the G 38, took part in the occupation of Norway. Apparently both these aircraft were lost during this operation, for no further information has come to light as to their fate. As early as 1939 it became apparent that a long range bomber was indeed needed, particularly in the prosecution of the naval war, and the Focke-Wulf Fw 200 airliner was converted into such a type. The Luftwaffe also demanded that the He 177 be built with two twin engines to enable it to be dive capable. However, it never attained full operational status.





*Junkers Ju 89 V 1 after completing factory trials, with registration D-AFIT. It proved necessary to install the larger counterbalanced vertical stabilizers.*





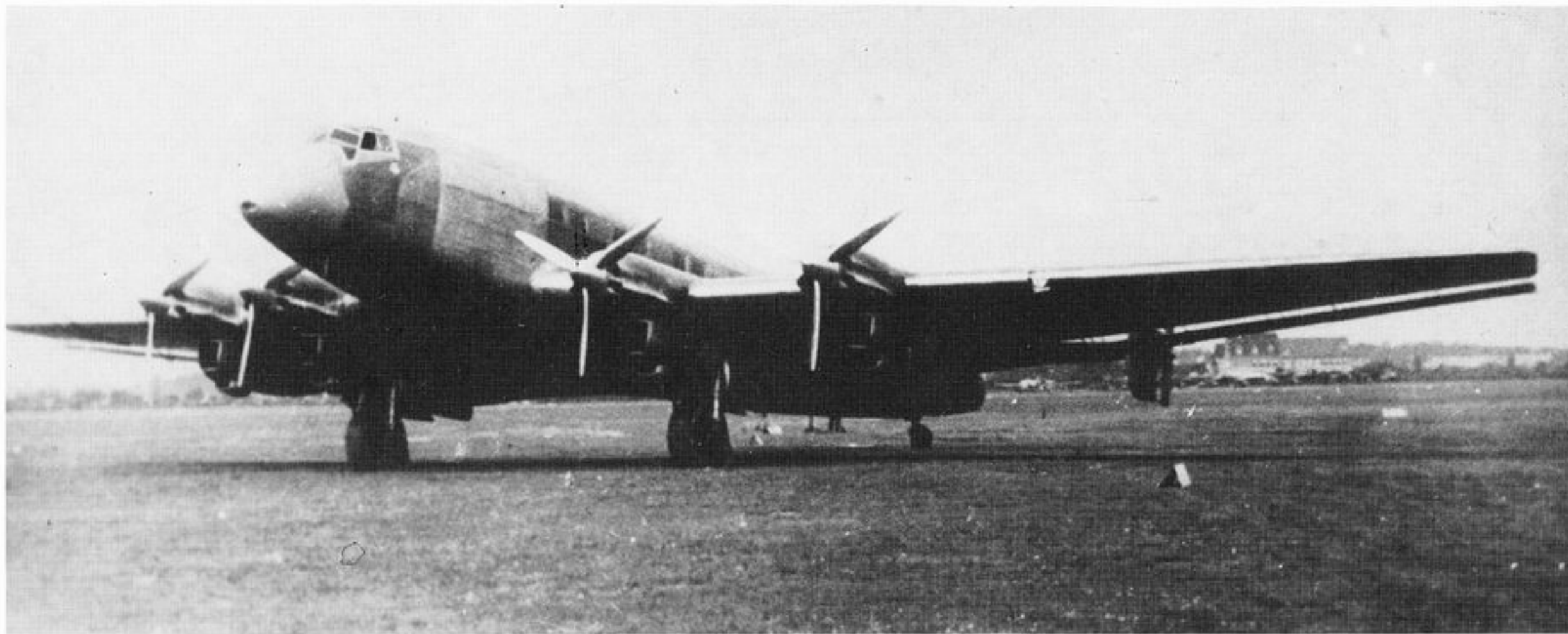
*Junkers Ju 90 V 1, Werknr. 4913, D-AALU, completed its first flight on 7 June 1937. Captain Kindermann used this aircraft to set two world records.*



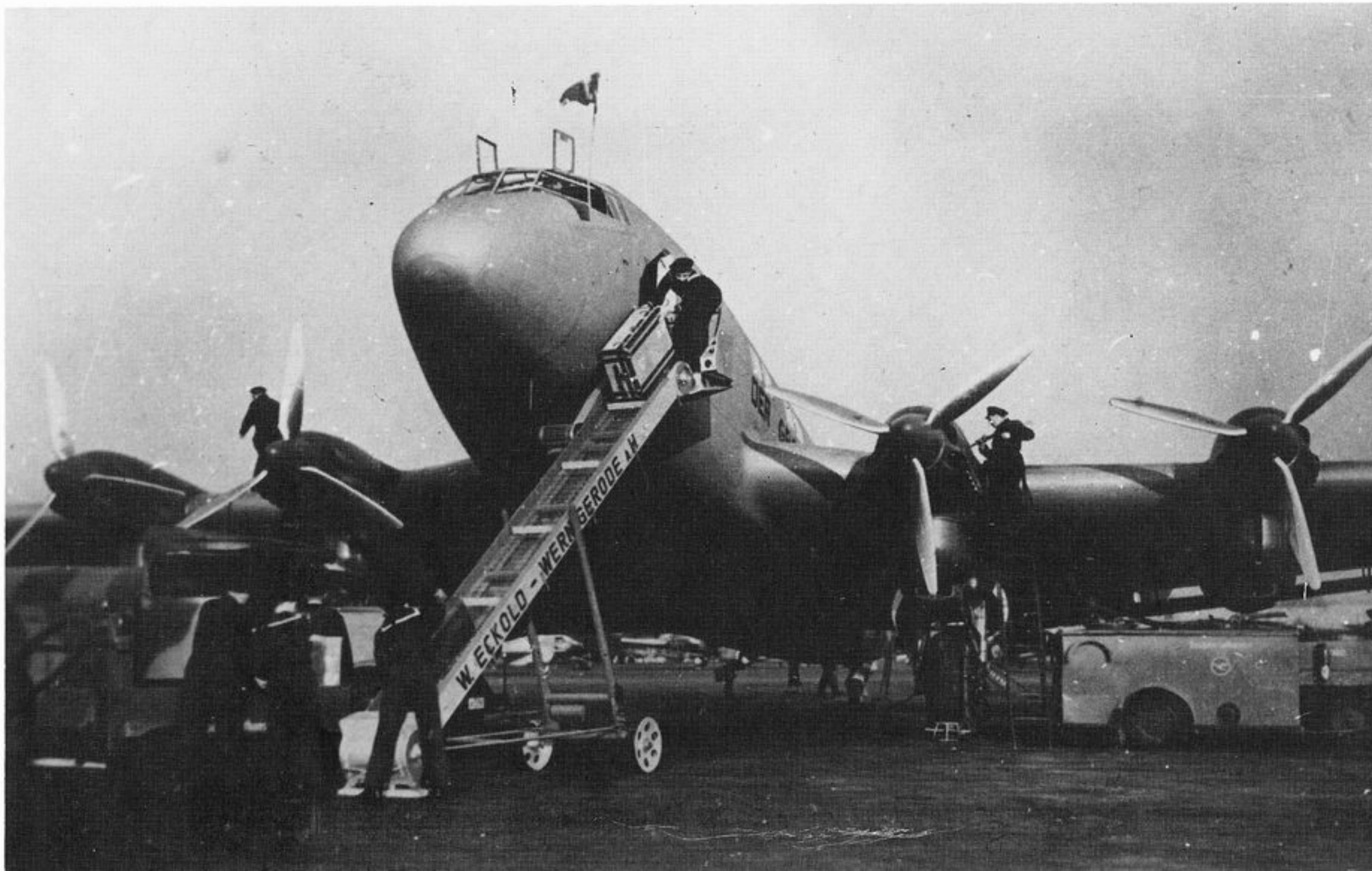
## Development and Operations of the Ju 90.

Construction of the Ju 90 resulted from a contract issued by Deutsche Lufthansa, which in early 1936 called for the development of a large capacity passenger airliner which could carry 40 passengers at a speed of 300 km/h over a range of 2,000 km. Junkers quickly submitted plans based on the Ju 89; wings, control surfaces and landing gear was borrowed without modification. In April 1936 construction began on the Ju 90 V 1. Since parts from the Ju 89 V 3, then being built, could be utilized, it was possible to roll the aircraft out of the assembly hangar after a construction period of just 16 months. The airplane, which was given registration D-AALU and the nickname "*Der Grosse Dessauer*", was powered by four Daimler-Benz DB 600 A-1s, each delivering 1,050 hp and having a constant output of 800 hp.

First flight took place on 28 August 1937 with Captain Zimmermann at the controls. Flight testing revealed no significant problems; only the vertical stabilizers needed to be enlarged. In addition, they were fitted with aerodynamic counterbalances to make control easier. Then came the first blow for the Ju 90 program: the DB 600 was dropped in favor of the fuel-injected DB 601, which was approved exclusively for the Bf 109 manufacturing program. Therefore, the next two Ju 90s, V 2 D-AIVI "Preussen" and V 3 D-AURE "Bayern", had to be fitted with the BMW 132 H, a copy of the American Pratt & Whitney S1 EG Hornet, which had a takeoff performance of 880 hp and constant output of 560 hp.



*Above: The Ju 90 V 1 in Dessau prior to its maiden flight.  
Below: Loading freight on the Ju 90 V 1.*

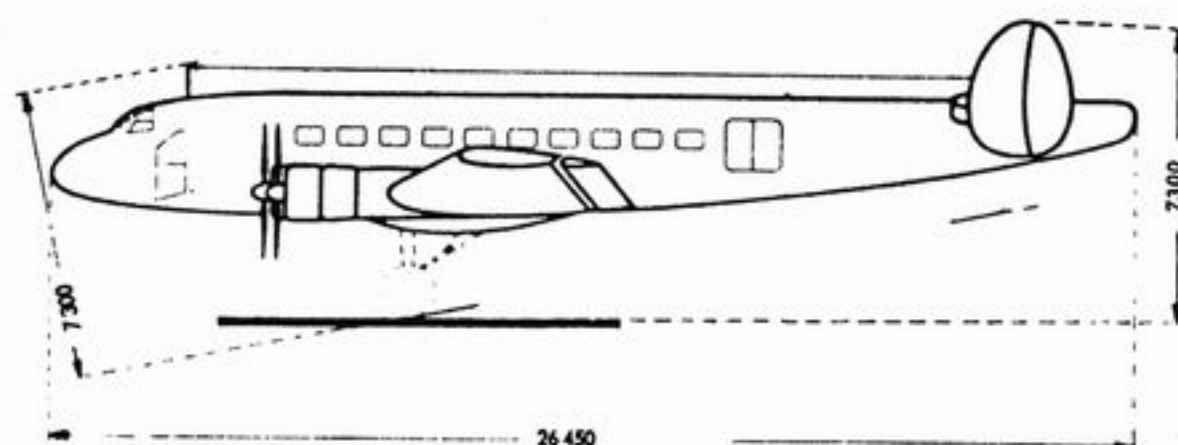
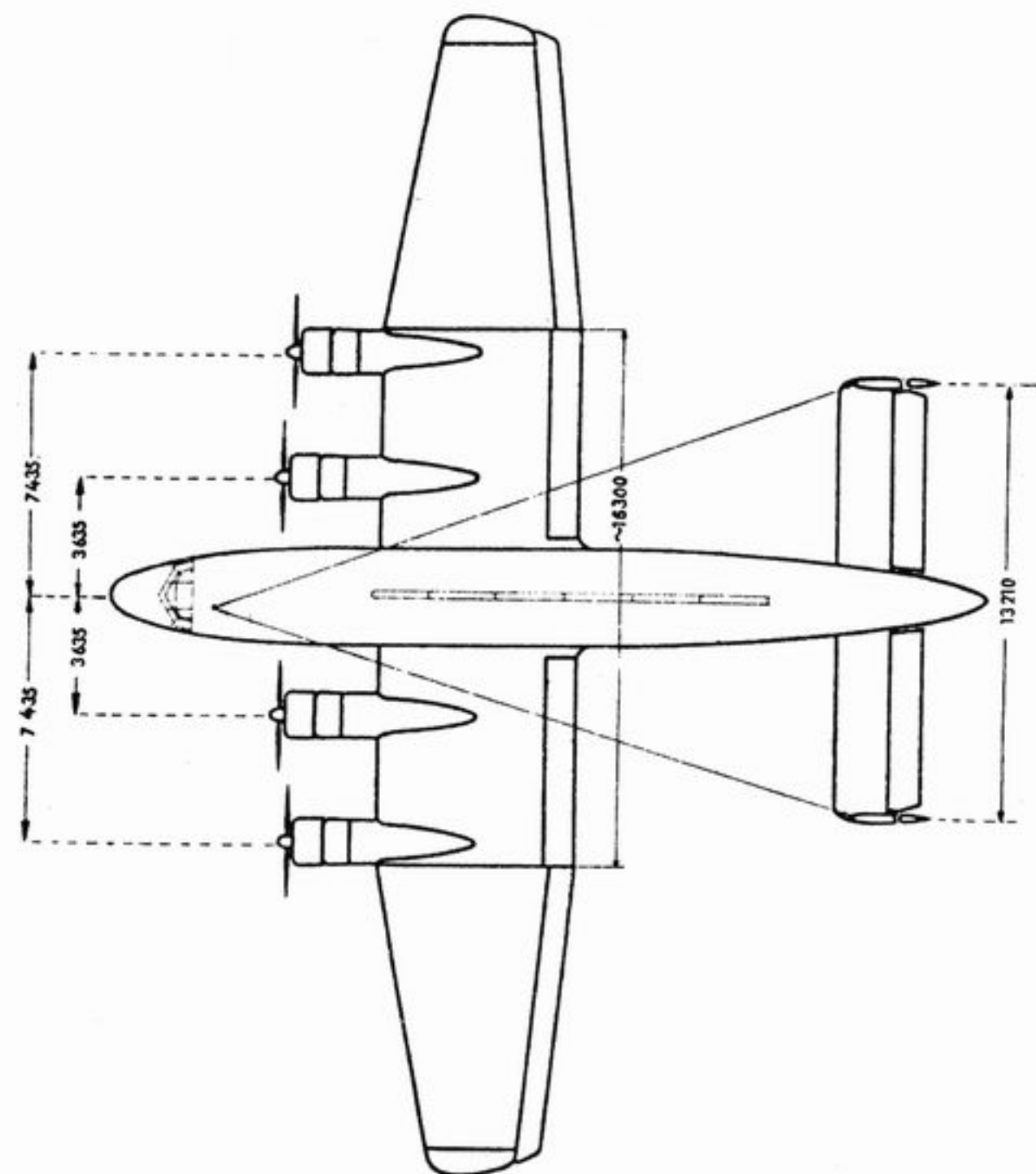
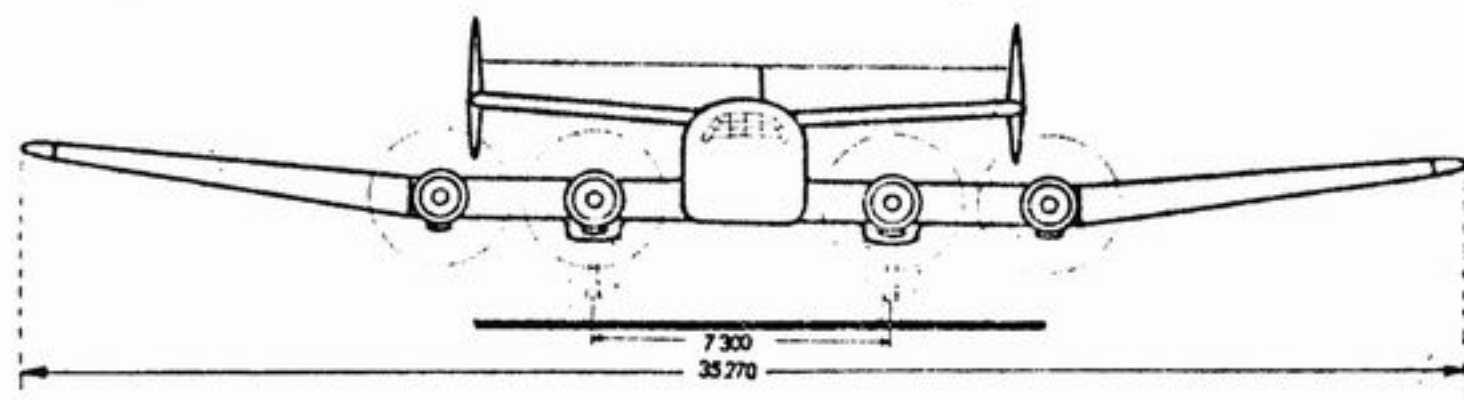




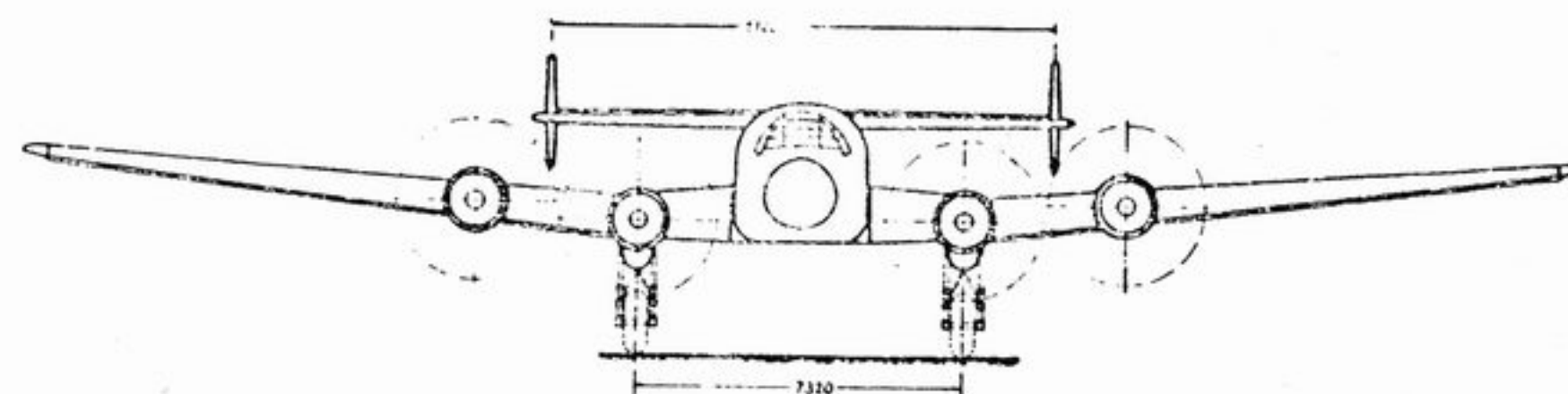
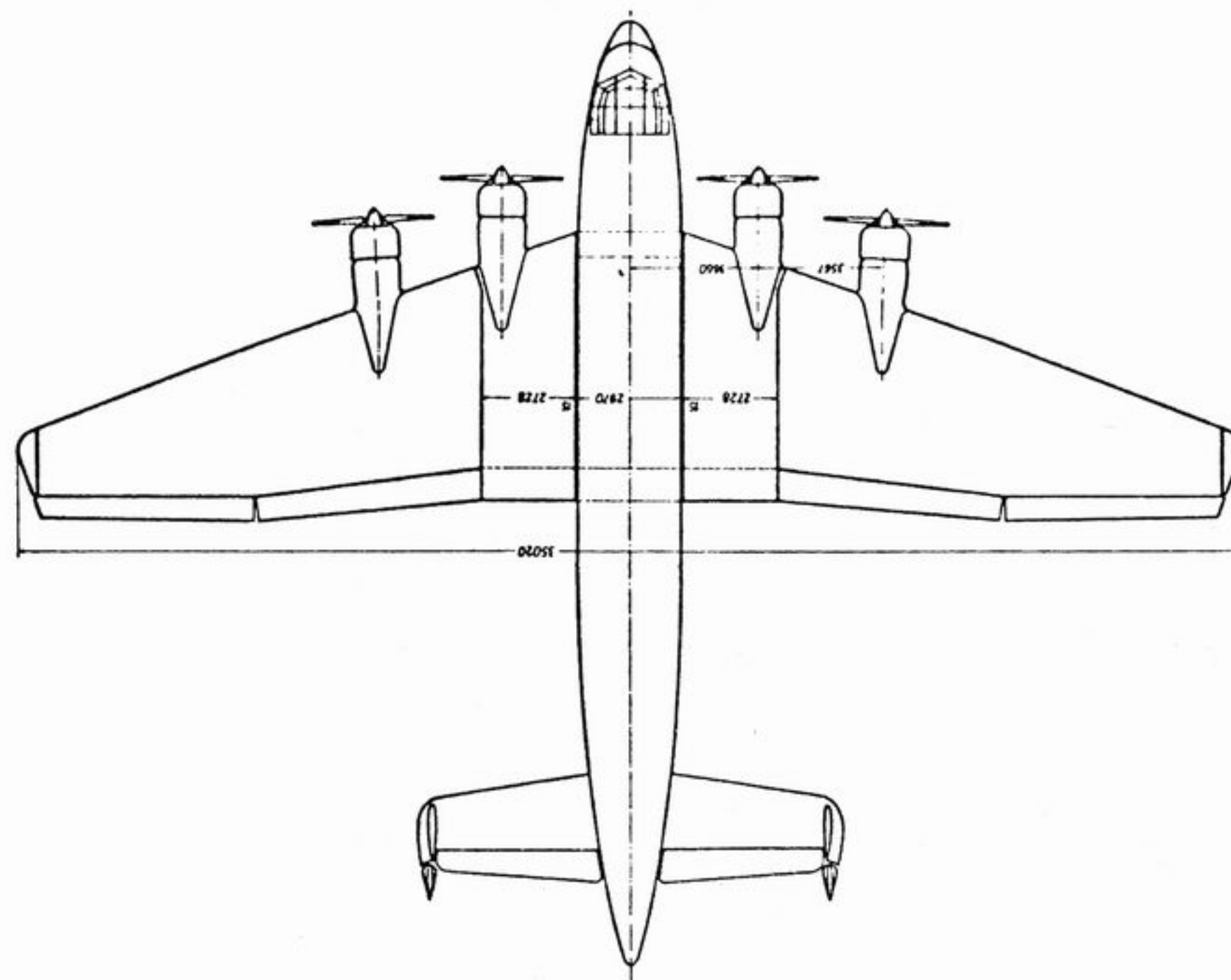
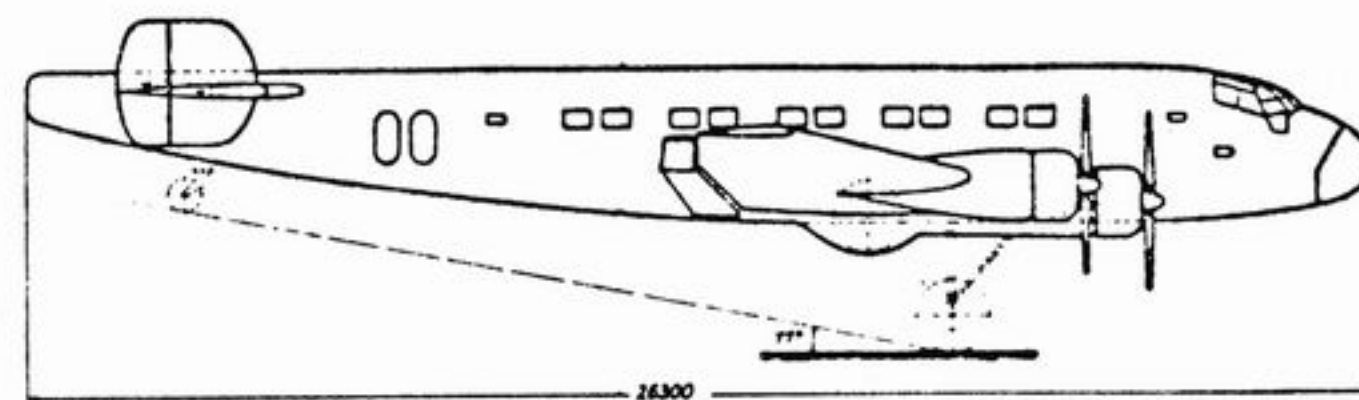


*Lufthansa's Ju 90 B-1, Werknr. 900001, D-ABDG, "Württemberg."*





*Initial design of the Ju 90.*



*Company drawings of the Ju 90 B.*





*Non-smoking section in the passenger compartment of the Ju 90 B-1.*

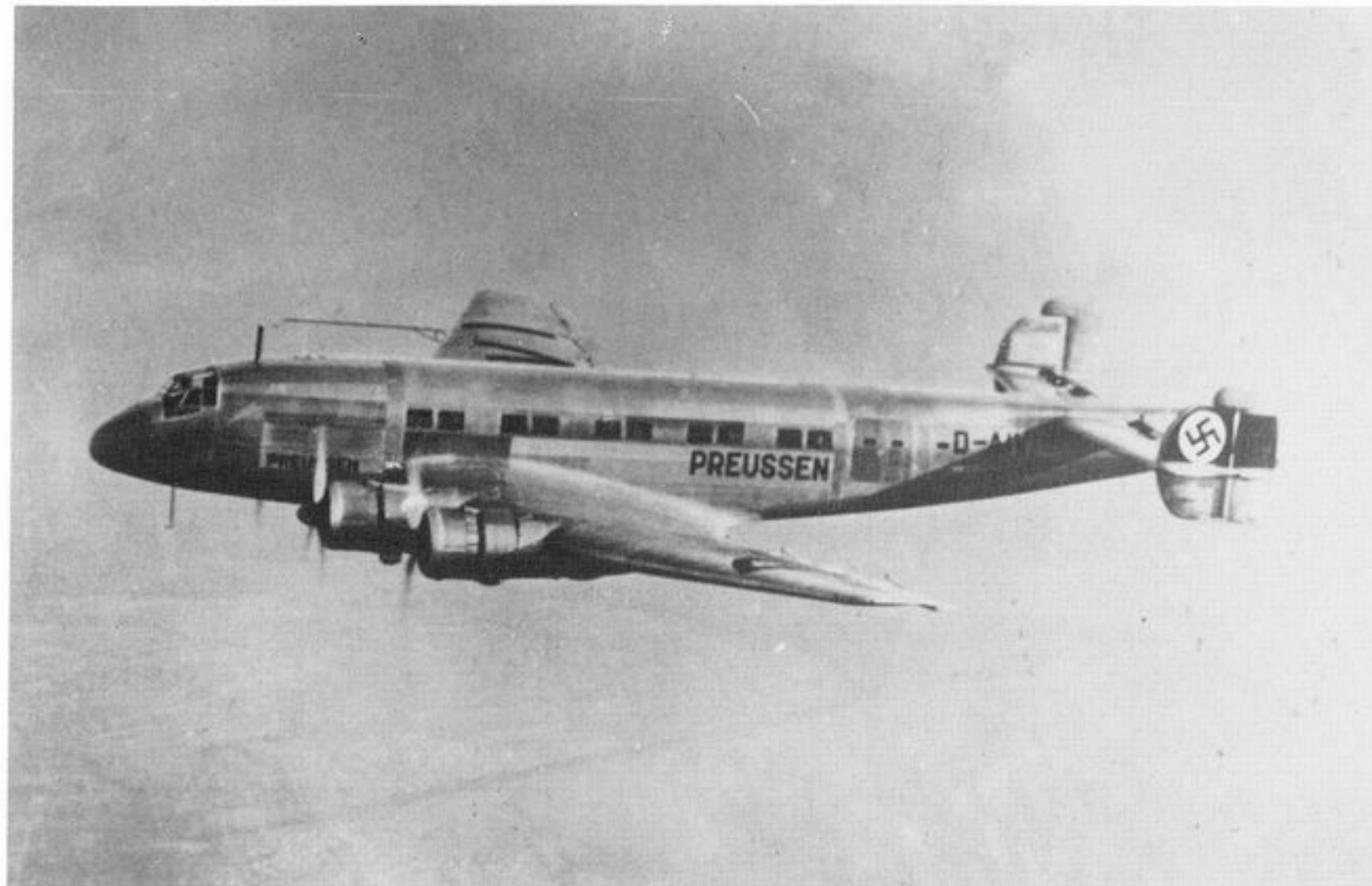
This version, designated the Ju 90 B, was nevertheless produced in a small series of eight aircraft, but these didn't prove entirely satisfactory. The second blow struck Deutsche Lufthansa even harder: Ju 90 V 2 was flown to Africa on long range and tropical environment tests. During particularly adverse conditions on takeoff in 1938, two engines on one side gave out and the machine crashed at Bathurst. Three of Lufthansa's best pilots, Untucht, Blankenburg and Kirchhoff, and three sea captains were killed in the crash. Only three crew members survived.

The record setting flights of Captain Kindermann showed what the Ju 90 could do with the right engines. Ju 90 V 1, D-AALU, set two world records: with 5,00 kg cargo it reached an altitude of 9,312 m, with 10,00 kg 7,242 m!

Lufthansa only received four of the eight Ju 90s it had ordered, with the remainder going to the Luftwaffe. The following Ju 90 B- and V-series aircraft flew with civil registration: D-ABDG, D-ADFJ, D-ADLH, D-AEDS, D-AFHG, D-AIVI, D-AJHB, D-ASND, D-ATDC, D-AURE and D-AVMF. D-AEDS was the replacement for D-AIVI, the plane which had crashed in Bathurst. Two Ju 90s were have been delivered to the South African Airways, but the war prevented this from occurring. They were registered as ZS-ANG and ZS-ANH.

However, the latter was not given to Lufthansa, but to the Luftwaffe. It was the first to be fitted with the new BMW 801 engines, which gave a takeoff output of 1,580 hp. Other than the engines, it was virtually the same as predecessors V 1 through V 4. This aircraft, too, met with misfortune. The airframe was probably not suited to the heavier and stronger powerplants. During the acceptance flight, Captain Kindermann literally flew the aircraft to pieces. Nobody was able to determine what actually happened. According to Captain Brauer, Kindermann suddenly found himself in the open air hanging from his parachute.

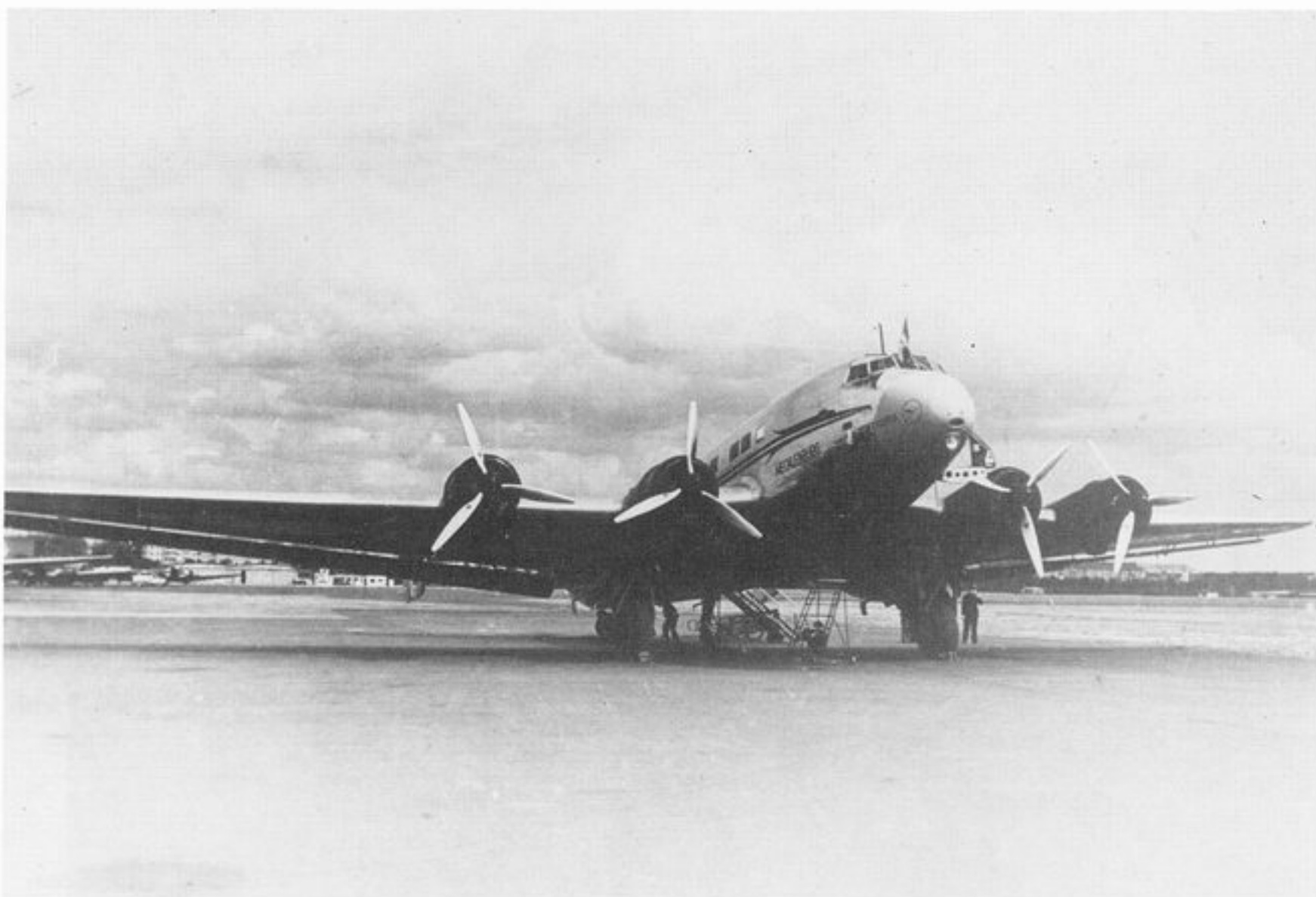




*Ju 90 V 2, Werknr. 4919, D-AIVI, "Preussen."*



*Ju 90 V 3, Werknr. 4015, D-AURE, "Bayern."*



*Ju 90 B-1, Werknr. 900006, D-ASND, "Mecklenburg."*



*To be accurate, "Mecklenburg" is the V 10, but was categorized as a B-1.*





*The Ju 90s in Luftwaffe service were painted with the Balkankreuz. D-ABDG "Württemberg" is in the foreground, while the aircraft in the background is D-ASND, "Mecklenburg."*



The next two Ju 90s were given a new shape, BMW 801s and modified control surfaces, all of which were incorporated during the course of testing. Ju 90 V 6, Werknr. 900003, D-ADFJ, was converted for military purposes during the construction phase. Both V 6 and V 7 were given new wings and, more importantly, fitted with a loading ramp in the fuselage floor. Fully extended, the ramp opened far enough to permit even heavy cargo to easily be loaded into the fuselage. staff cars, light reconnaissance vehicles and light half-tracks towing Paks or 2 cm flak guns could drive in under their own power. This type of cargo could then be air-dropped using specialized parachutes.

Ju 90 V 7, D-ADLH, generally corresponded to the V 6, but was part of the first pre-production batch stemming from Werknr. 4916. After being fitted with armament and specialized equipment, Ju 90 V 7 was given Luftwaffe registration code GF+GH. It can be considered as the actual testbed for the Ju 290 program. V 6 and V 7 had an armament suite consisting of a DL 131 turret mount on the fuselage spine behind the cockpit, a glazed rear position with MG 15 and one each of an MG 81Z in an underfuselage gondola, firing to the front and to the rear. Provisions were made for additional guns in the fuselage sidewalls.



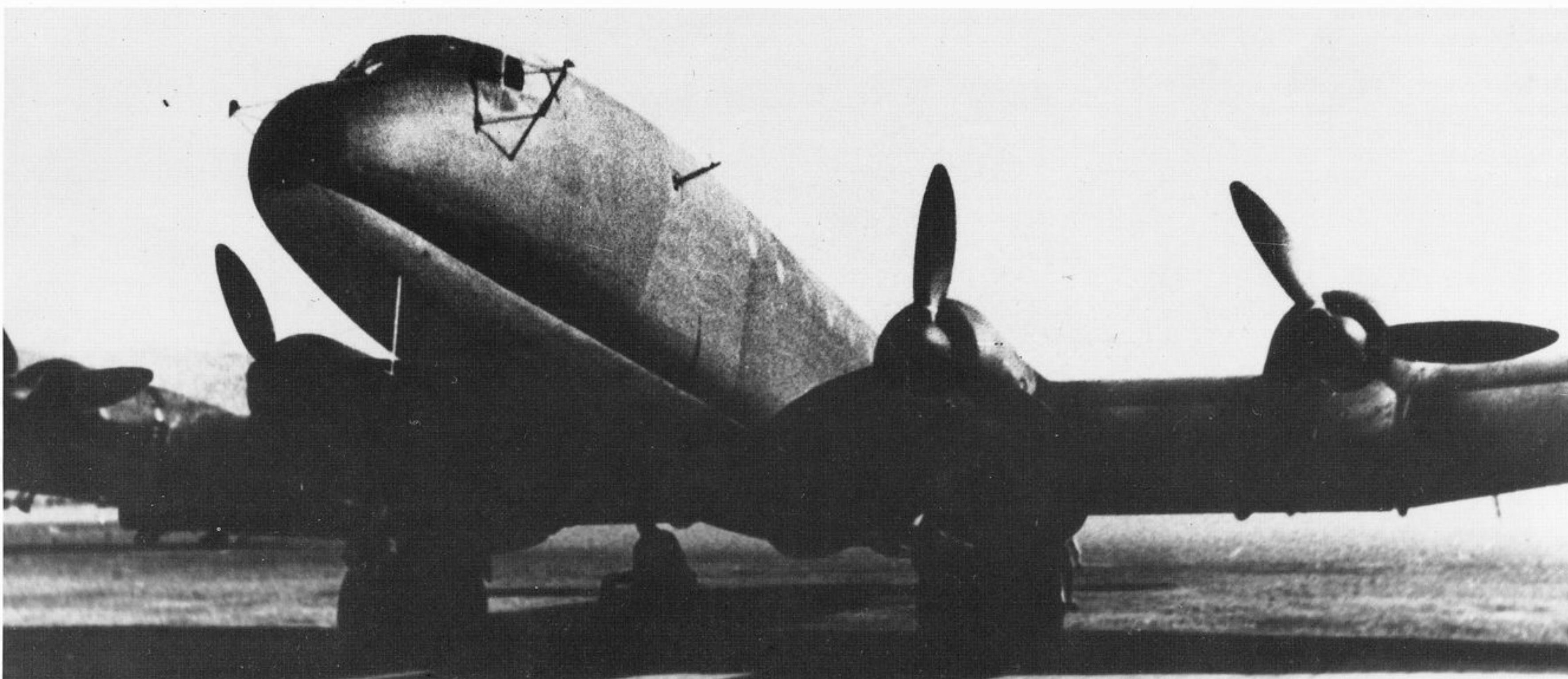
*Ju 90 V 5, ex D-AEDS, "Ersatz-Preussen", retained the fuselage and wings of the Ju 90 B, but was fitted with the control surfaces and engines of the first Ju 290.*



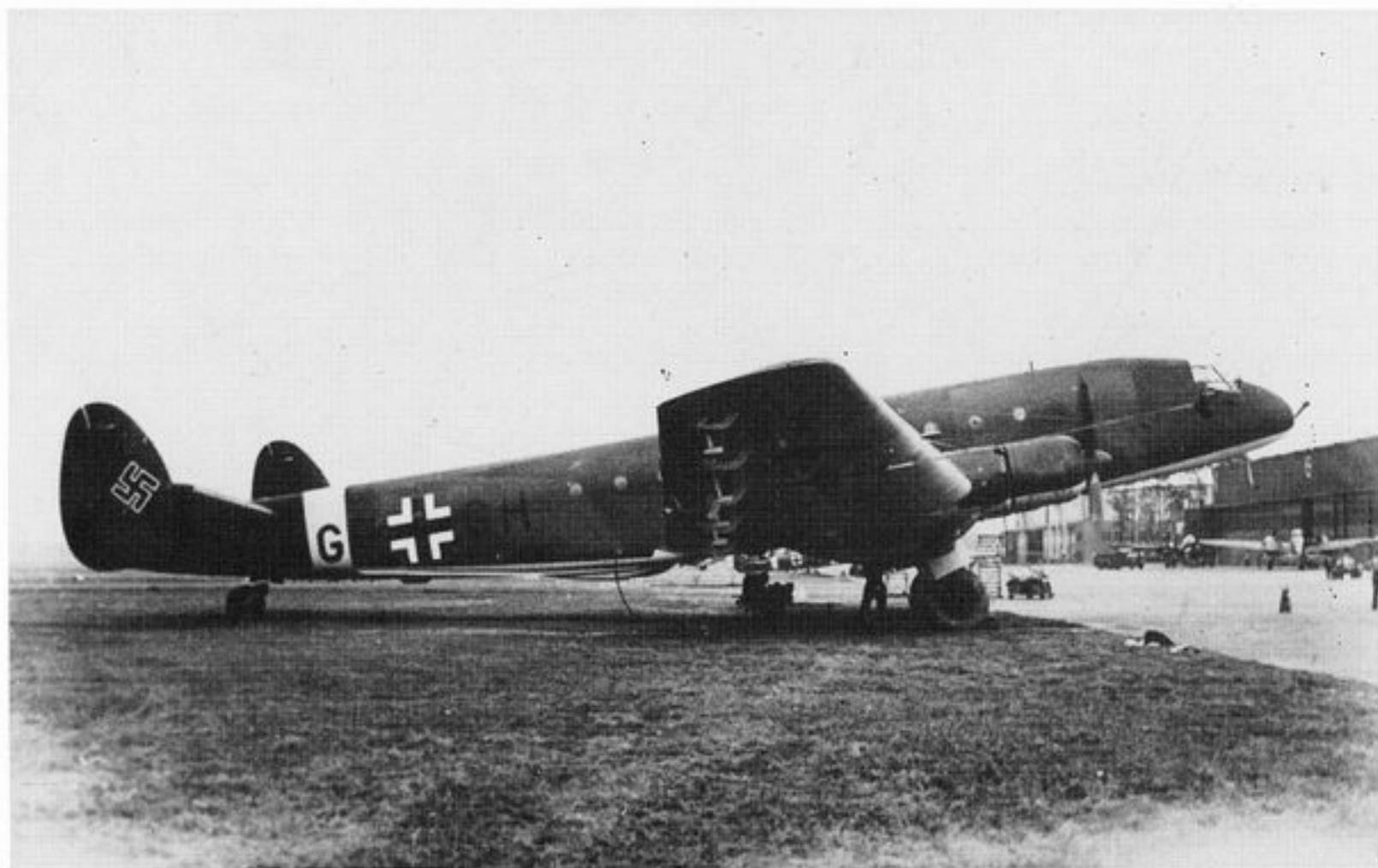




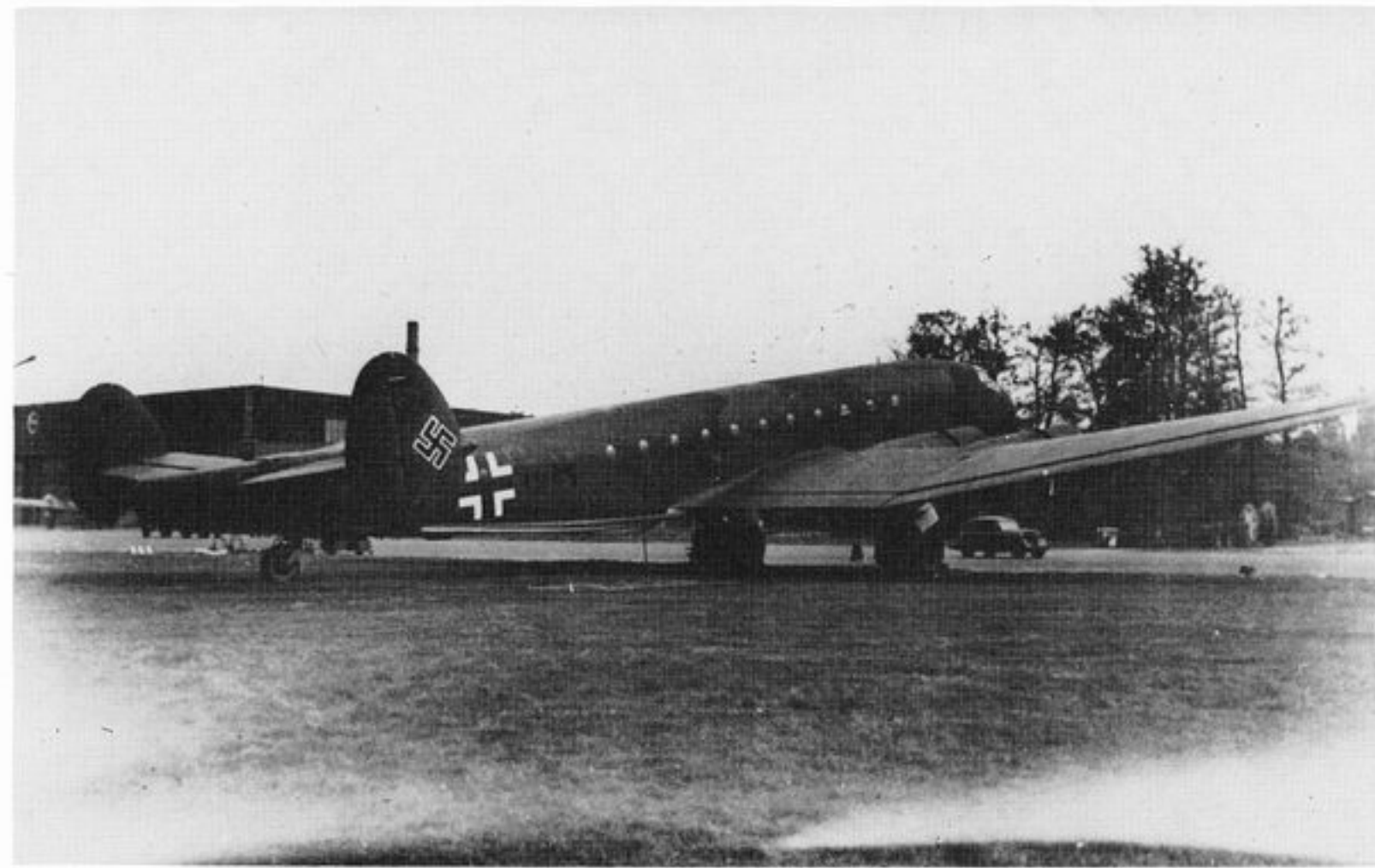
*Ju 90 V 7, GF+GH, primarily served as the testbed for the rear loading ramp.*



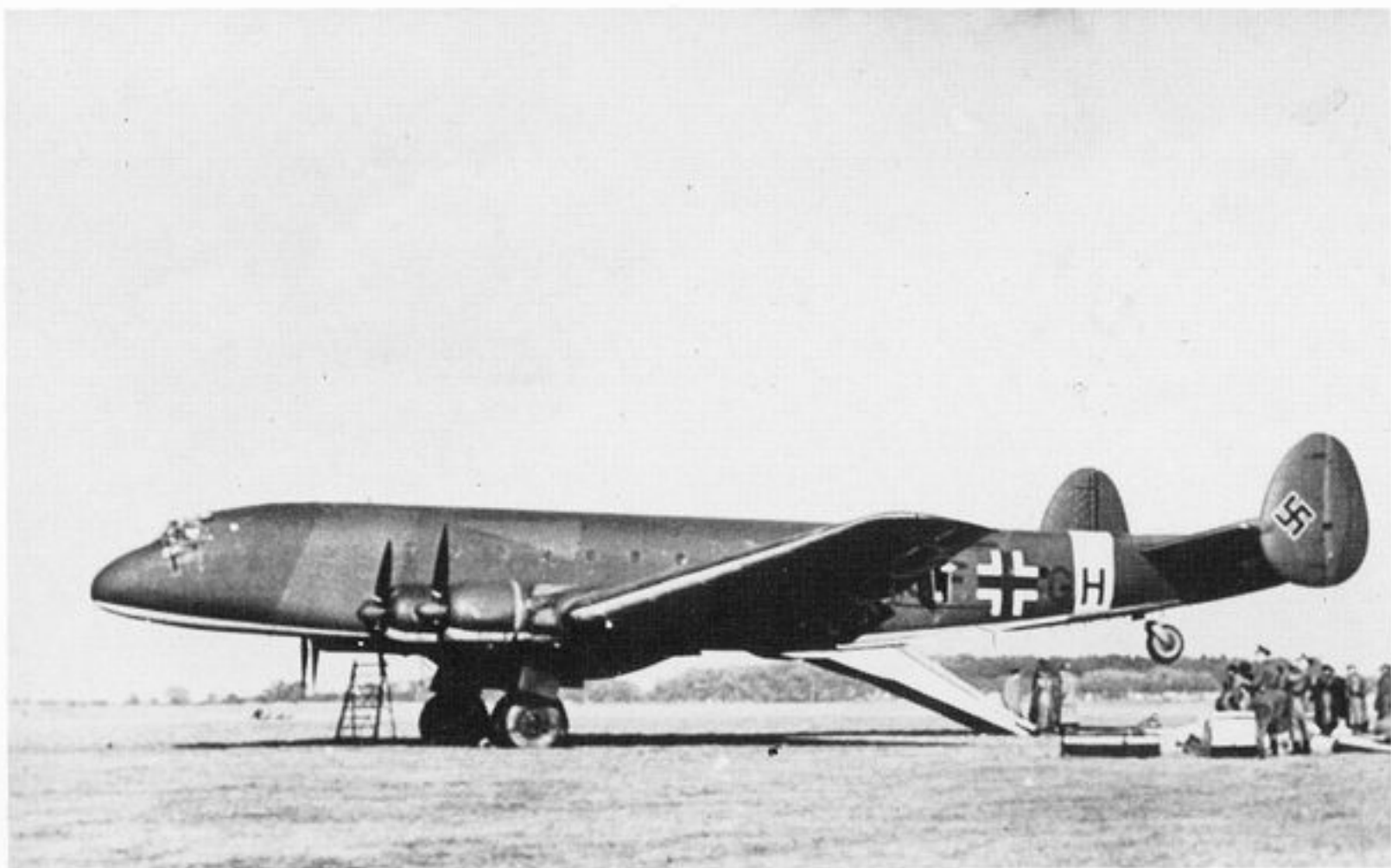




*The retracted loading ramp can be seen to good advantage in this side view of the Ju 90 V 7.*



*Ju 90 V 7 prior to being fitted with its armament.*



*Ju 90 V 7 with ramp fully extended.*



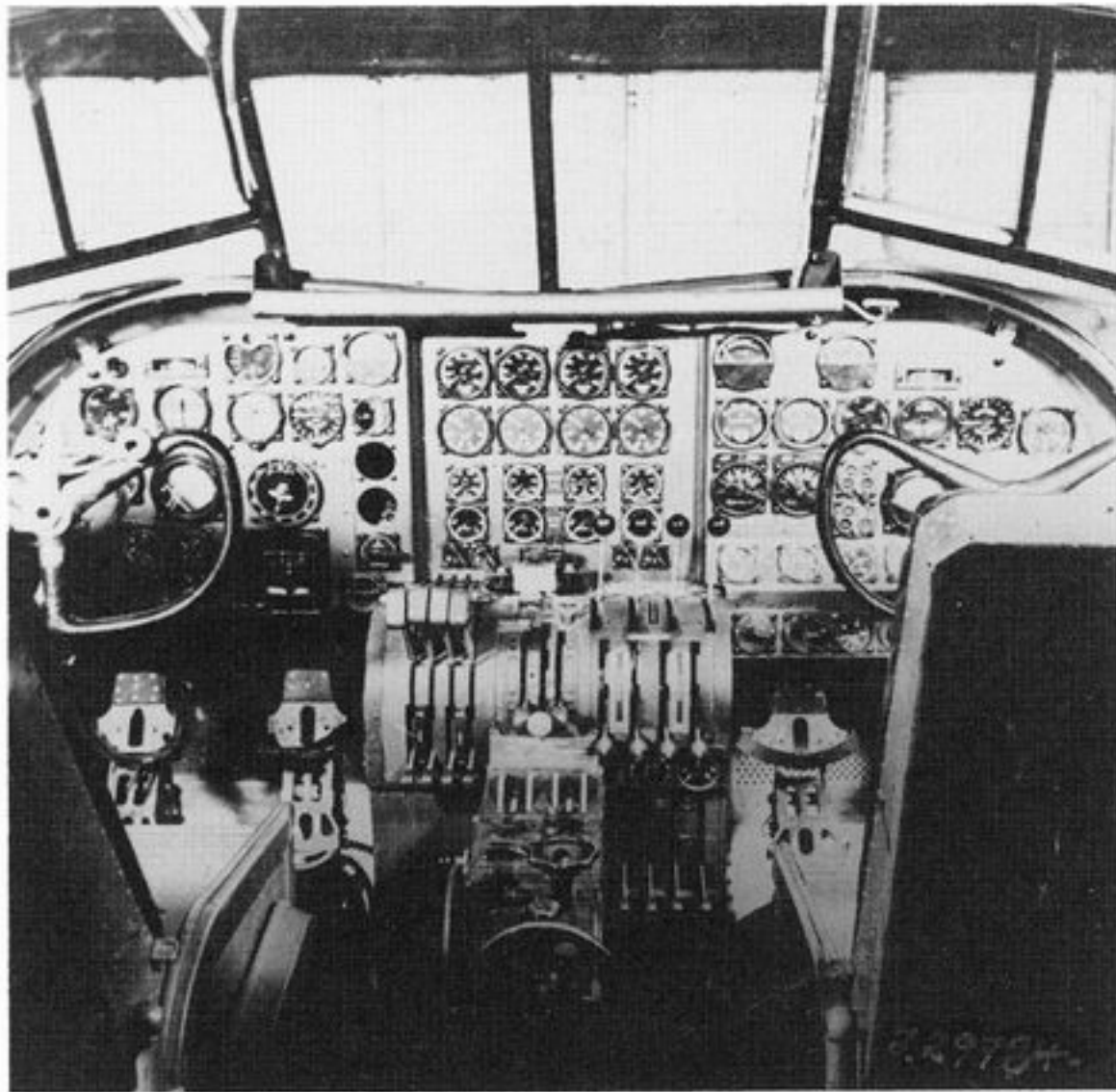
*The Ju 90 V 7 was used to test loading capabilities for many of the Wehrmacht's vehicles.*



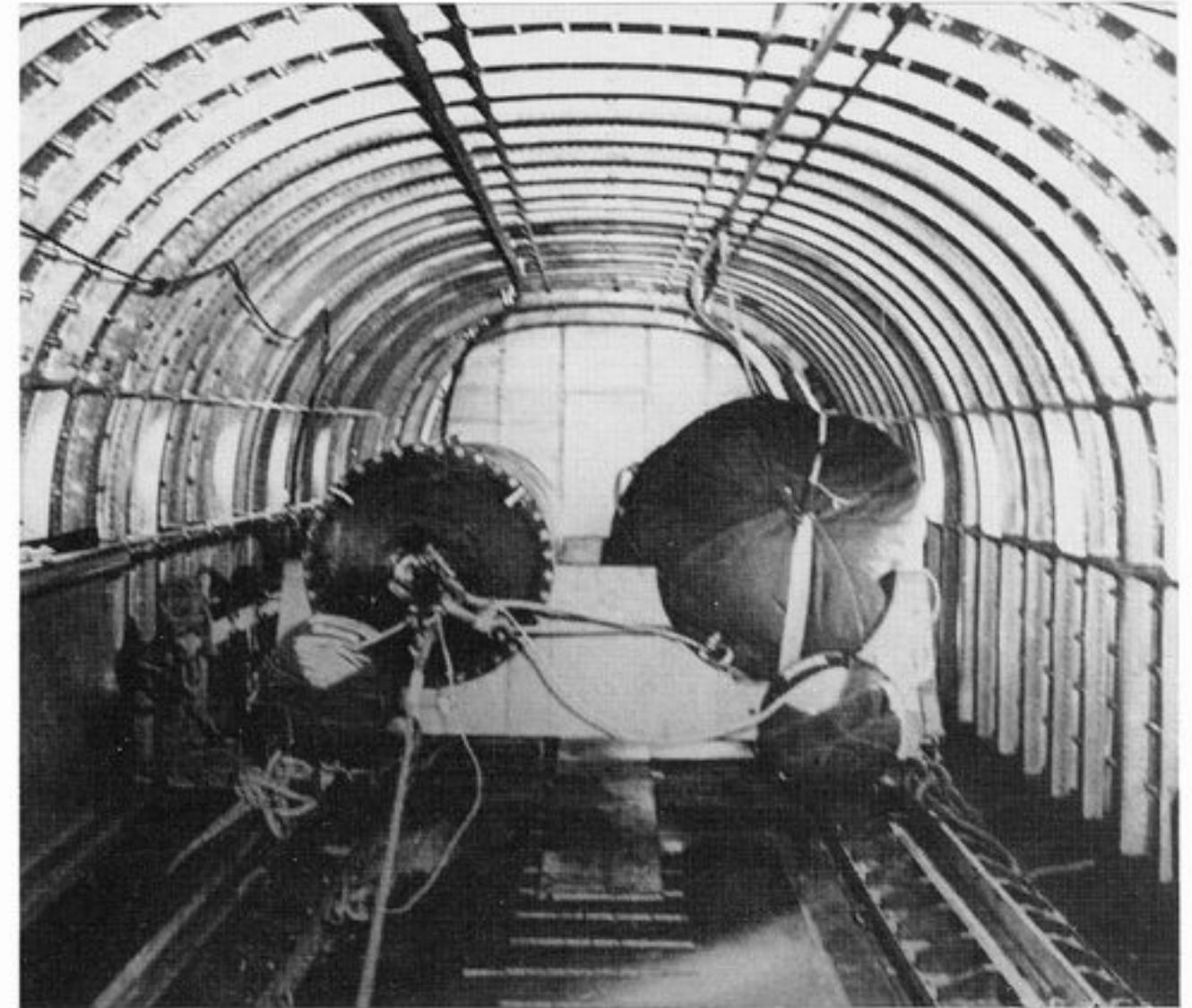


*Ju 90 V 7 was Lufthansa's former D-ADFJ, "Baden" (Werknr. 900003), which now flew under the registration GF+GH.*





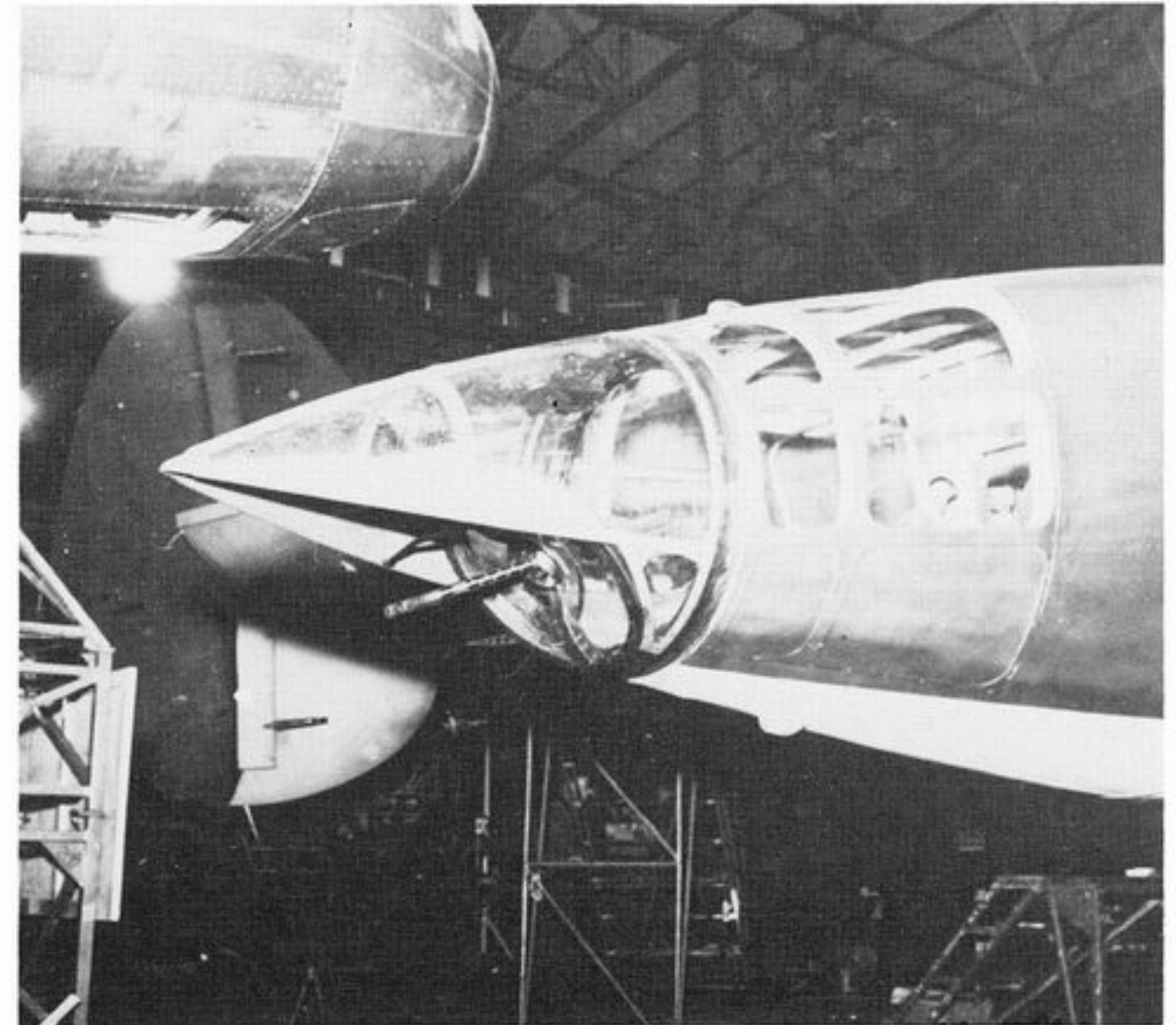
*Left:  
Cockpit of the Ju 90 V 7.*



*Right:  
Loading engines and containers in  
the V 7.*



*Left:  
Testing a paratroop slide in the V  
7.*



*First test fitting of a rear gunner's  
station with MG 15.*





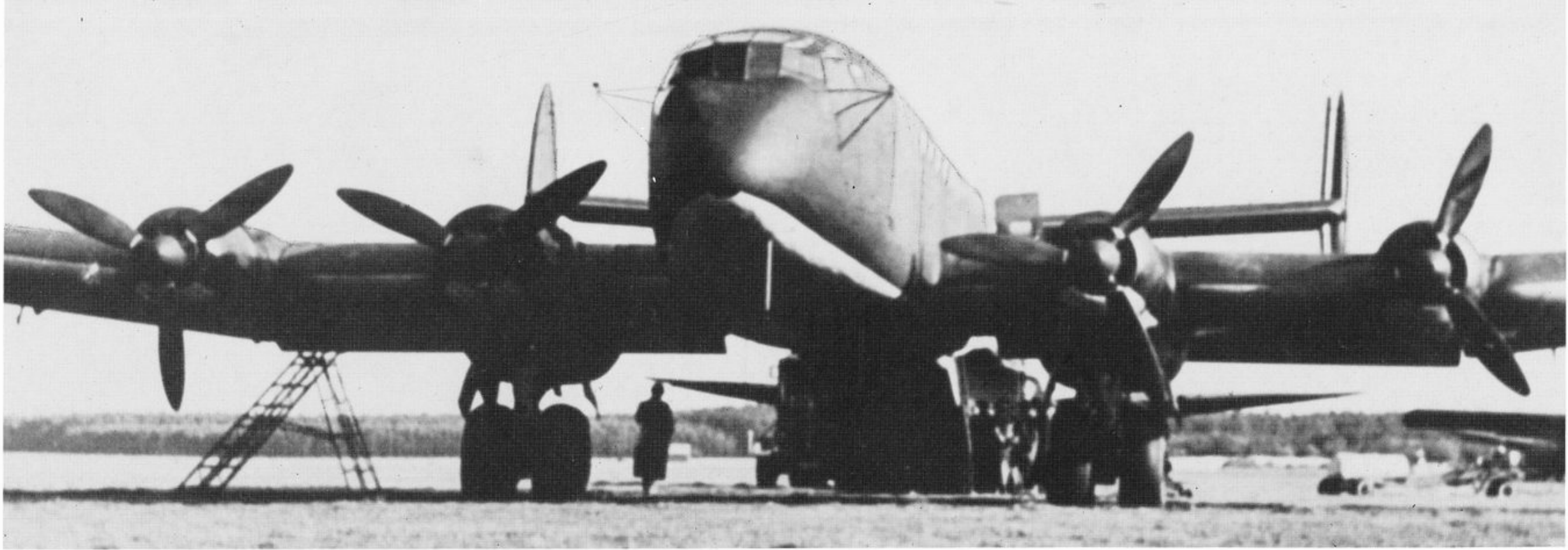
*Above:  
An Sd.Kfz. 250 armored car drives up into the Ju 90 V 7.*

*Above right:  
V 7 in flight, with open ramp ready for air-dropping cargo.*

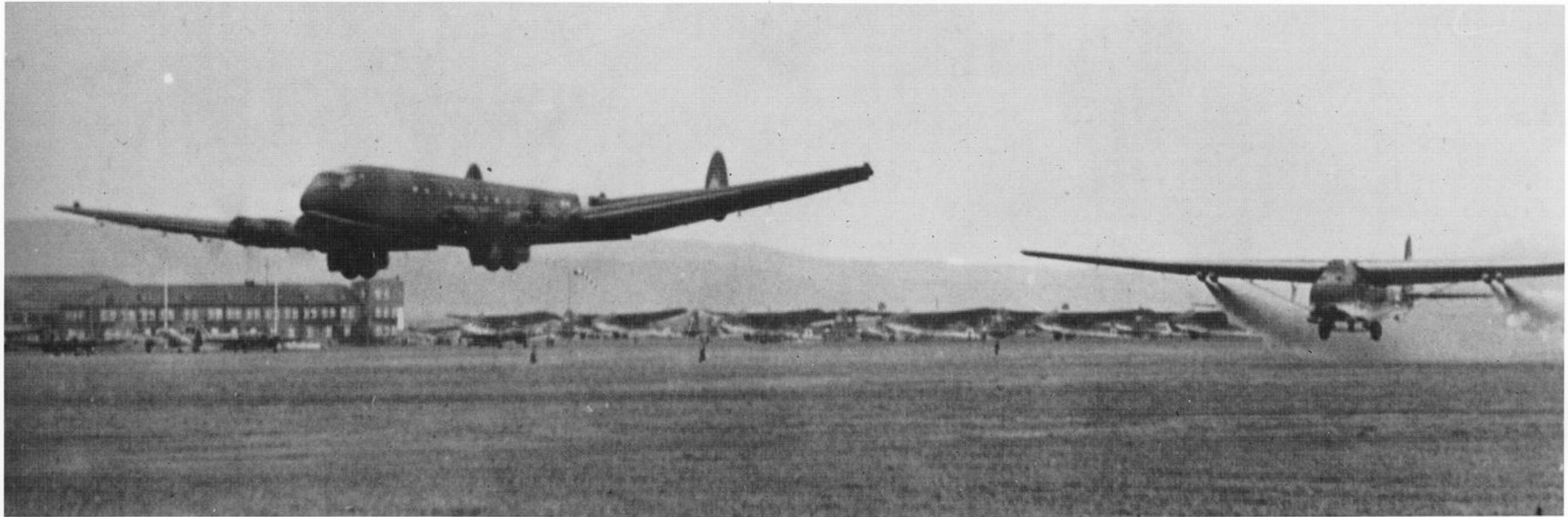
*Right:  
Paradropping a BMW engine.*







*The Ju 90 V 7 was the only aircraft which could tow the Messerschmitt Me 321 transport glider by itself. Pictures are from testing in Lechfeld.*

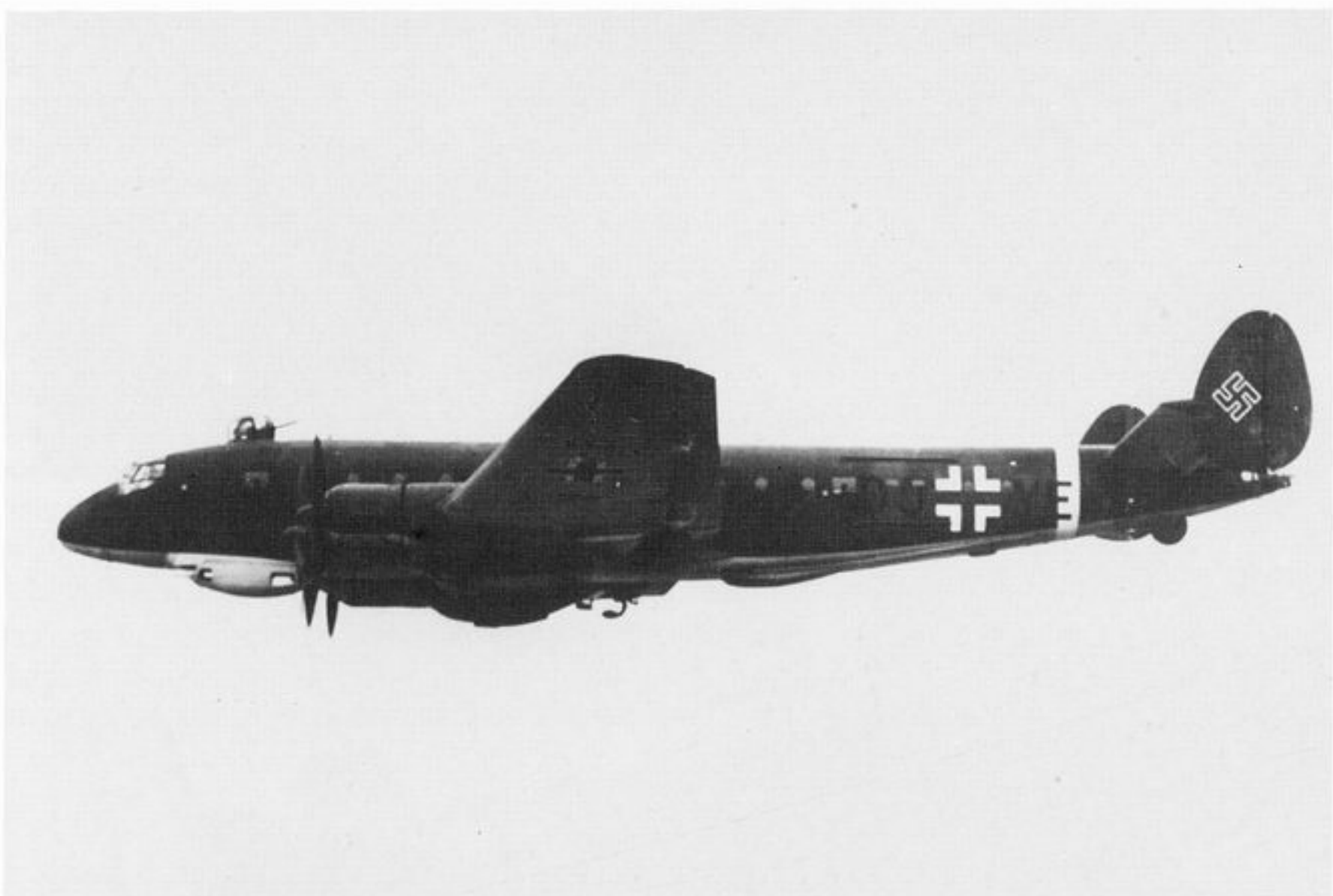






*Ju 290 V 2, Werknr. 2900004, D-AQJA later became DJ+YE.*



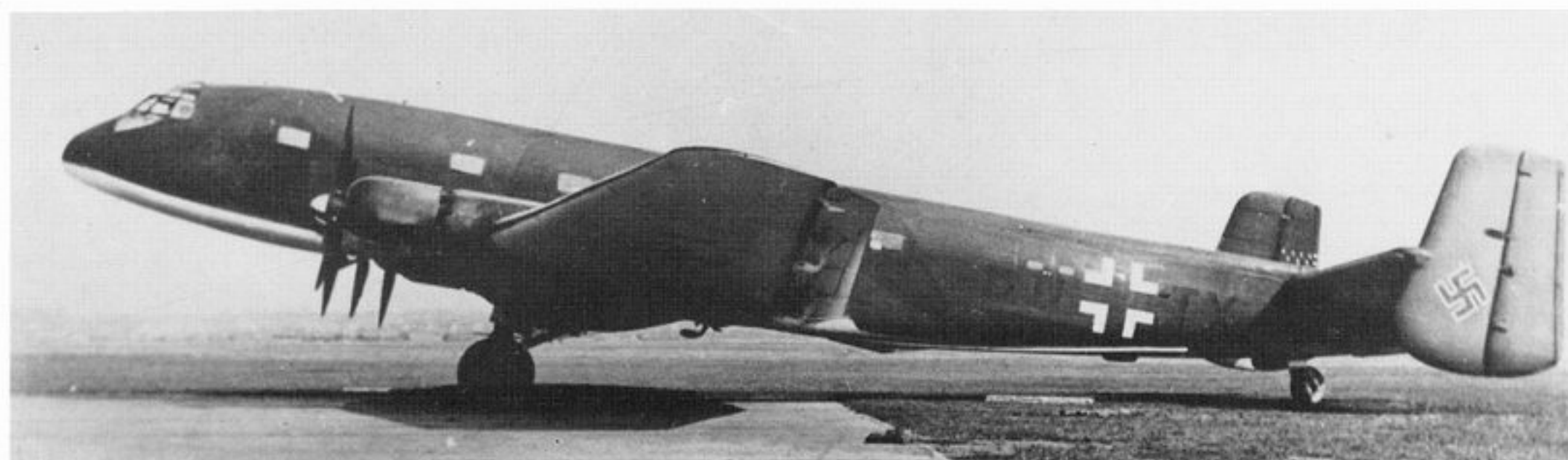
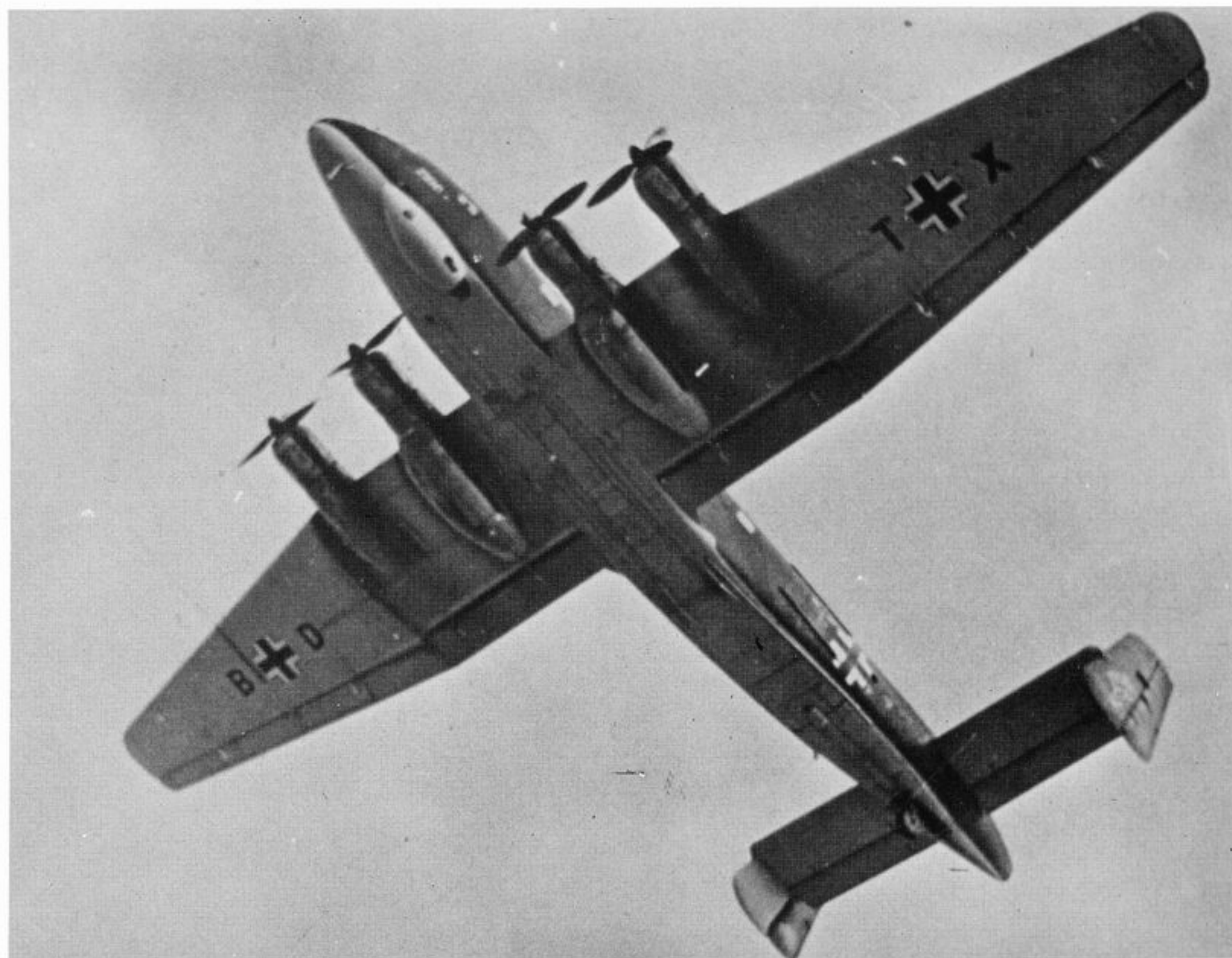


*This is the second prototype for the Ju 290, which was released to the press as the Ju 90 S. In fact, it is Ju 290 V 2, ex D-AQJA, Werknr. 290004, carried on Luftwaffe records as DJ+YE (see left page).*



Ju 90 V 7 underwent combat trials in the Mediterranean, where it proved itself to be a reliable aircraft. Based on the experiences with the V 7, the V 6 was later converted to the Ju 290, DJ+YE. The actual prototype for the Ju 290 was Ju 90 V 11, Werknr. 90007, originally D-AFHG before being registered as BD+TX. Of the two Ju 90 Bs scheduled for delivery to South African Airways, ZS-ANG became D-AQJA and the Ju 290 V 2, while the V 6 as DJ+YE became Ju 290 V 3. Ju 90 V 9, ZS-ANH, was turned over to Lufthansa, as was V 10 D-ASND. The remaining three Ju 90s, Werknr. 900008 through 900010, were production Ju 90 B-1s and were handed over to Lufthansa as D-ATDC, D-AJHB and D-AVMF.

*Ju 290 V 1 was the former Ju 90 B-1 (V 11) Werknr. 900007, "Oldenburg" and was given the new coding of BD+TX. It was in this aircraft that pilot Haenig (below) crashed on 12 January 1943 over Stalingrad.*

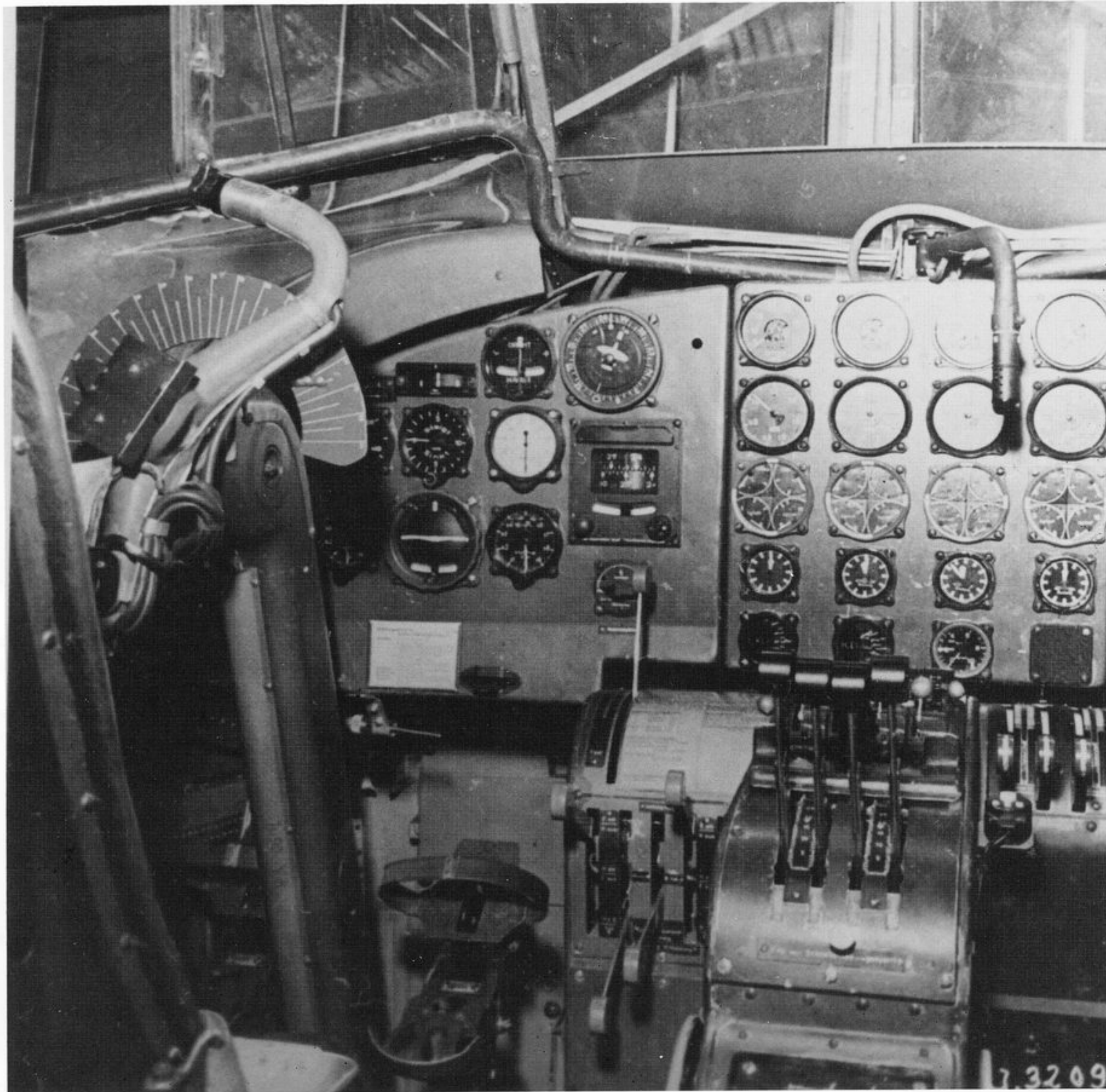




# The Ju 290

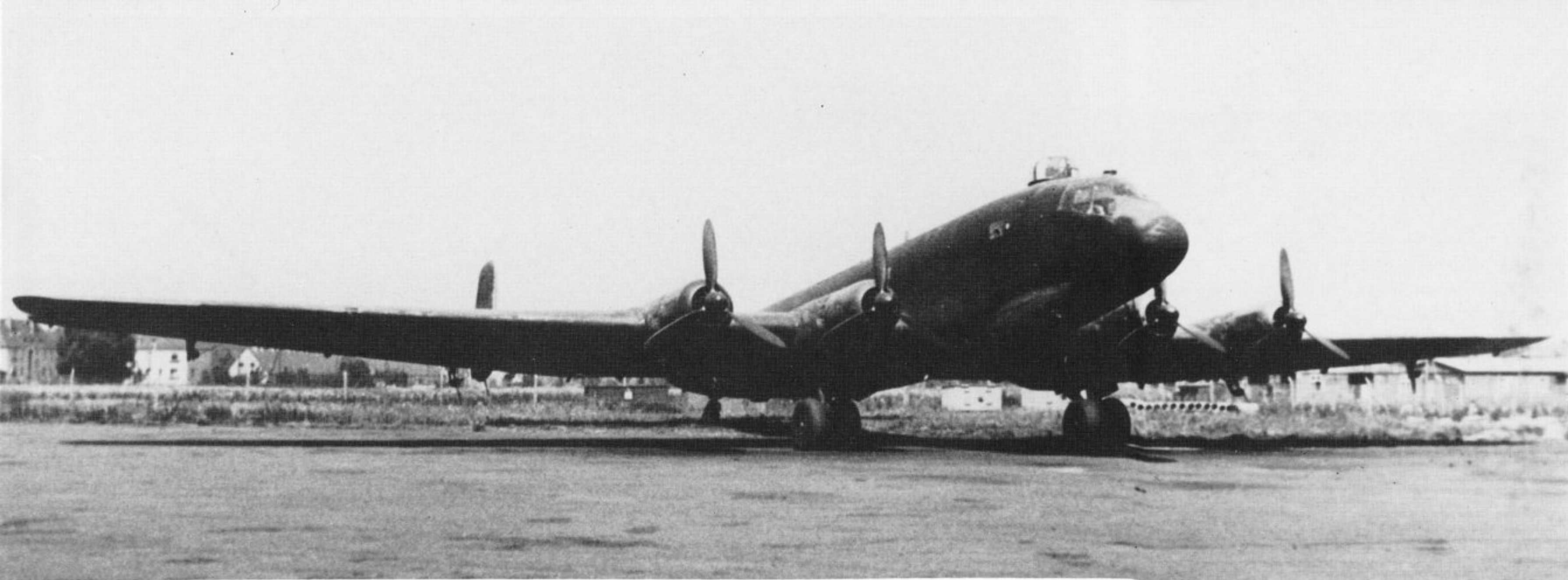
Comparable to the V 1 through V 3 prototypes of the Ju 290, by the end of 1942 nine Ju 290 A-0s had been built. These machines were not only used for resupplying the Afrikakorps, but also employed in the Battle of Stalingrad. Just a few days prior to the capitulation of Stalingrad, Ju 290 V 1 piloted by Captain Haenig made an attempt to fly wounded soldiers out of the pocket. The aircraft was hit by artillery fire on takeoff, but Haenig tried to pull the aircraft up anyway, stalling in the process. The stretchers and beds, which hadn't been tied down properly, slid to the tail with such force that the aircraft crashed tail-end first.

Front-line operations revealed that the Ju 290's defensive armament needed to be reinforced. The Ju 290 A-1 series was therefore fitted with an MG 151/20 in place of the MG 131 in the turret and an MG 151 in the rear gunner's position. A long-range reconnaissance version, the A-2, was built from this series, which differed from the A-1 internally only in having larger fuel tanks and improved radio and navigation equipment. These machines were assigned to Fernaufklärungsgruppe (FAG) 5, which flew 30 missions against convoys bound for England in the time period between 15 November and 15 December 1943. During these 30 missions, the aircraft logged 415 flight hours and 120,350 kilometers. However, FAG 5 determined in its operations report that the range of the Ju 290 was inadequate for reconnoitering and engaging British-American convoys! It also called for a further increase in the aircraft's defensive armament. Handling characteristics of the Ju 290 were considered good, even when taking off in an overloaded configuration.

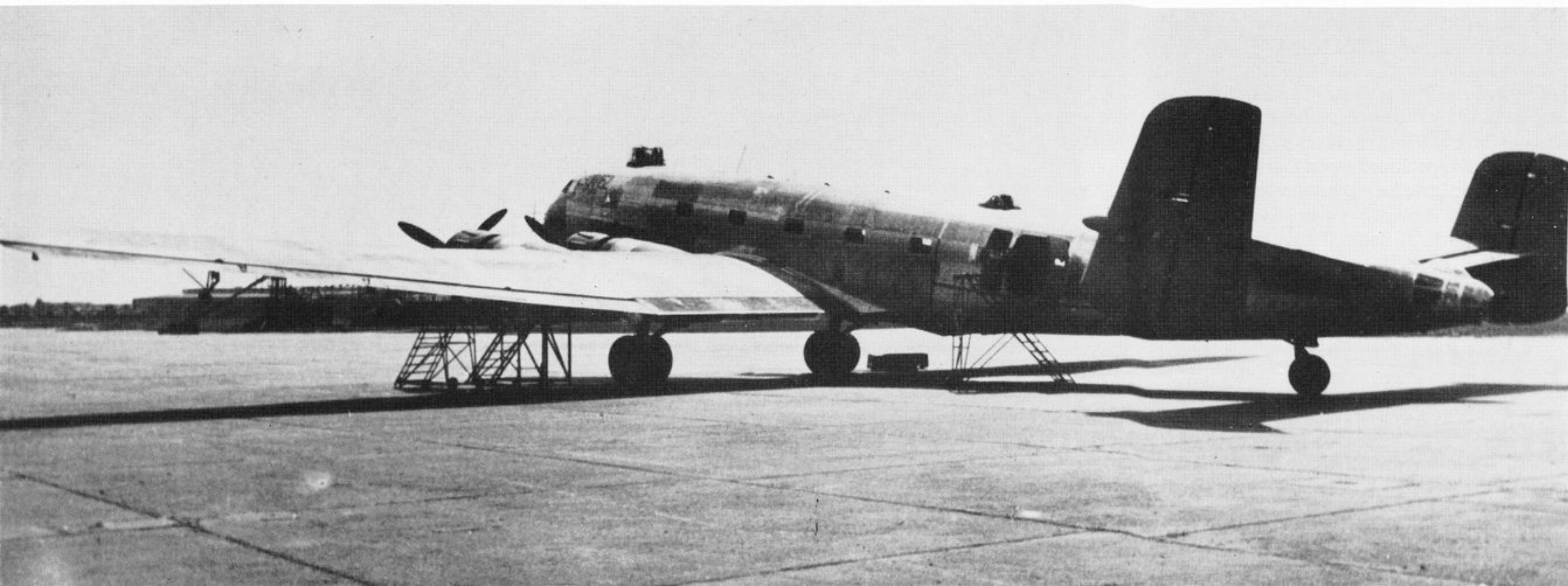


*Pilot's cockpit and instrument panel of the Ju 290.*





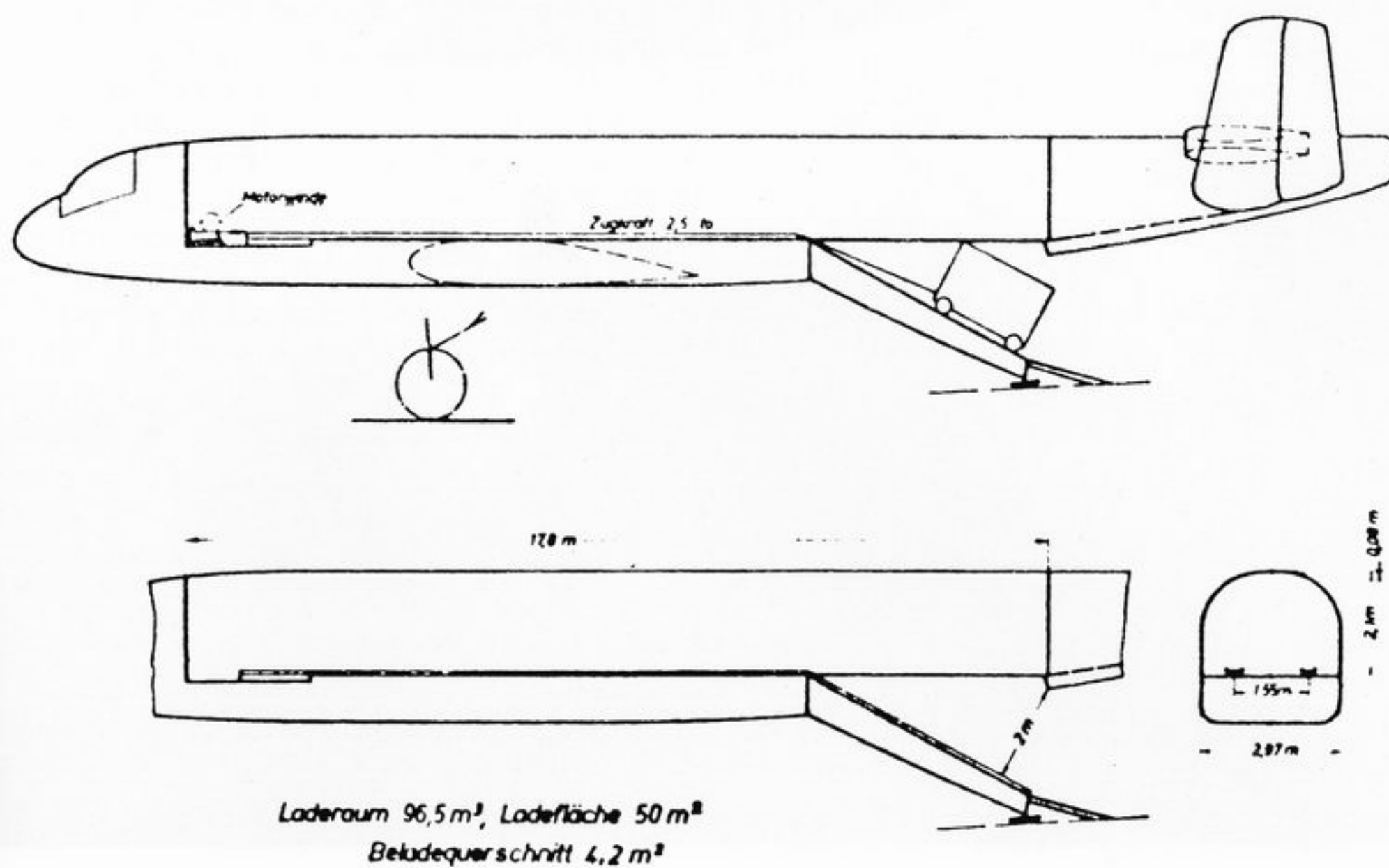
*Above: Ju 290 A-1, Werknr. 2900152, of Luft-Transportstaffel (LTS) 290, registration SB+QB, which crashed in Tunisia in 1943.  
Below: Ju 290 A-3, Werknr. 2900162, registration 9V+GK of FAG 5, shot down by British Mosquitos over the Atlantic.*



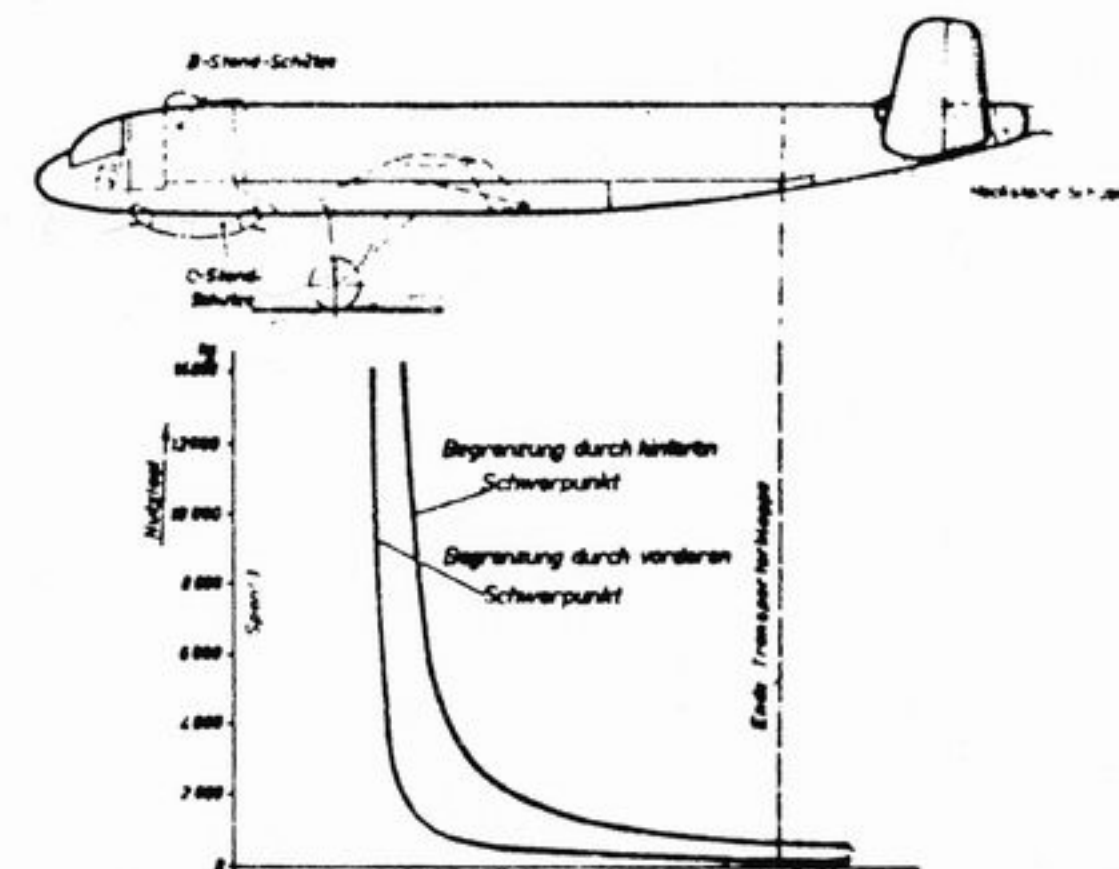




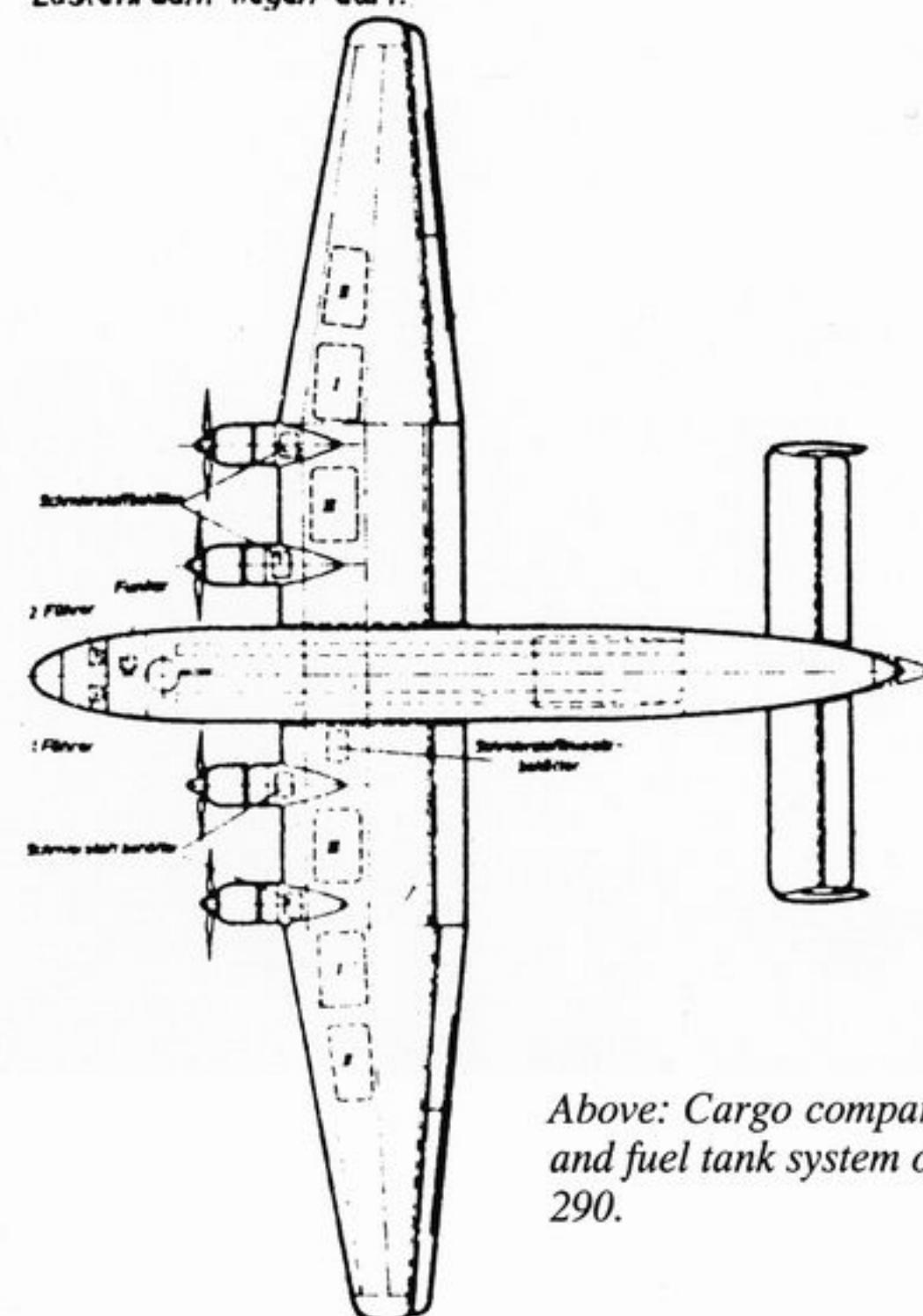
Ju 290 A-1, Werknr. 2900154, registration J4+AH, LTS 290 in Tunisia, where it was shot down in the spring of 1943.



Cargo area of Ju 90 V 7 with loading ramp.

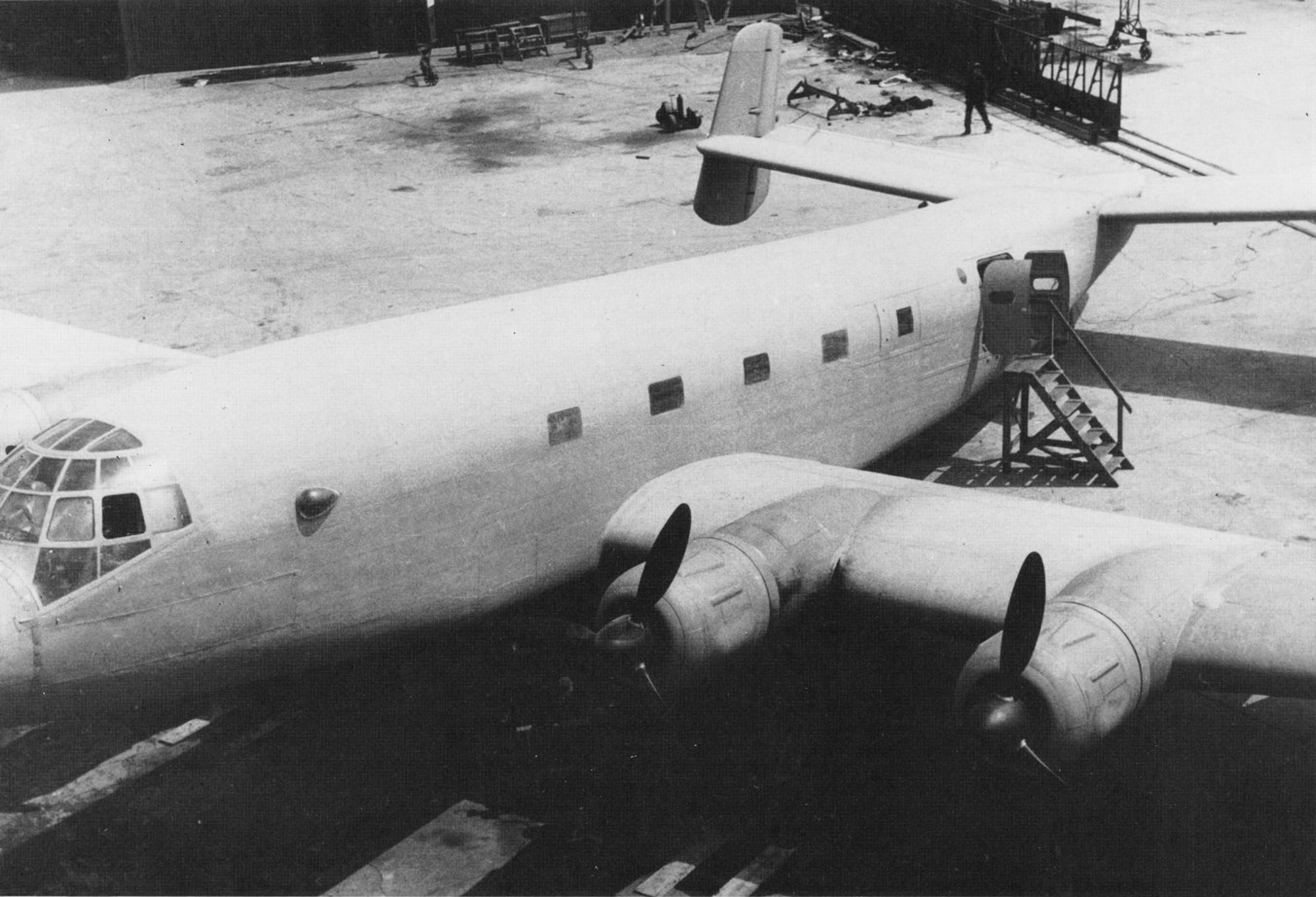


Auch bei Überlast keine Einschränkung der Beladung aus Schwerpunktsgründen, da Lastschwerpunkt auf Mitte Lastenraum liegen darf.



Above: Cargo compartment and fuel tank system of the Ju 290.





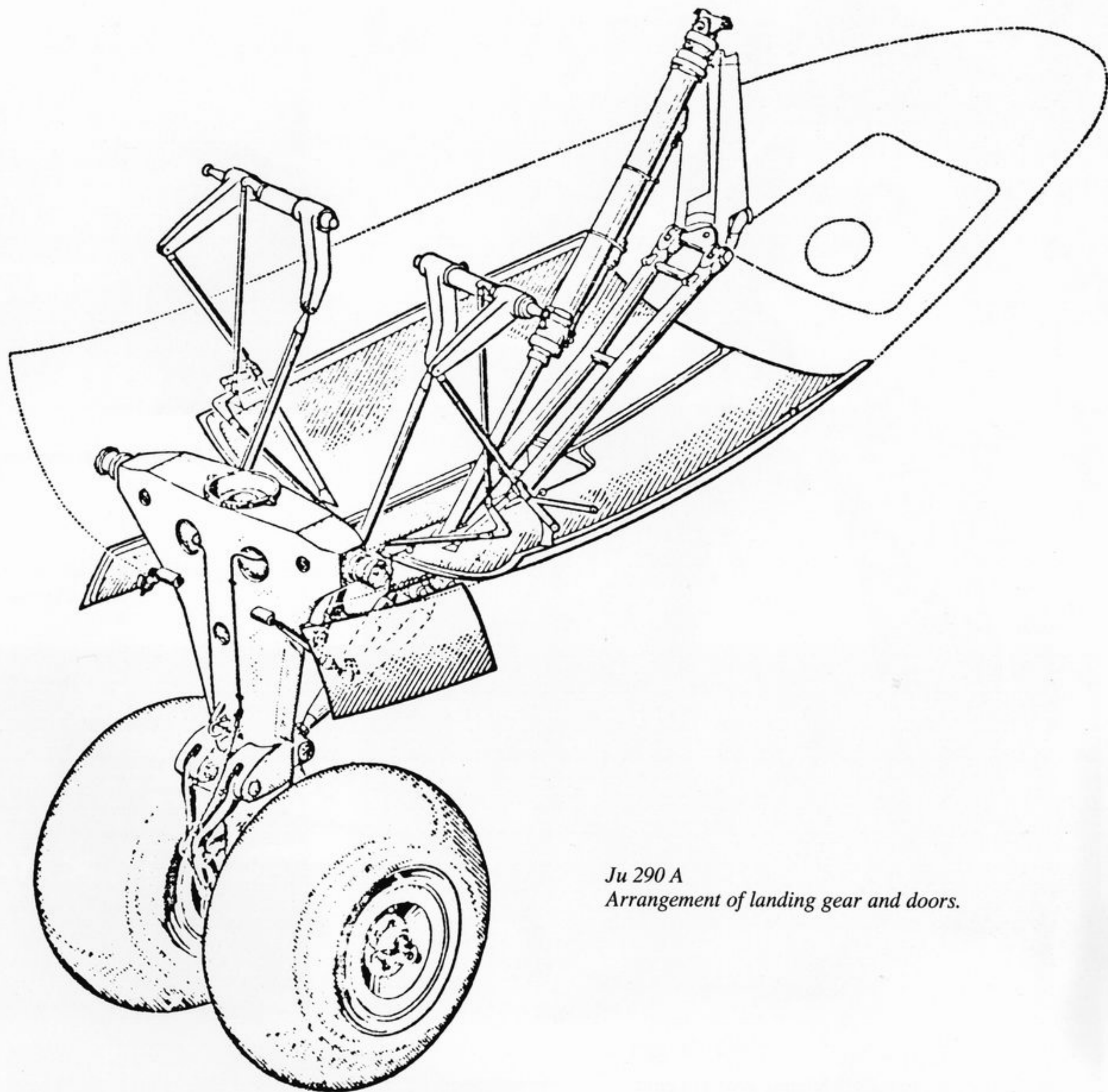
*Ju 290 A-3 in final stage of assembly at Letov in Prague-Ruzyn.*



As a result of all the experience accumulated, Junkers produced the Ju 290 A-3, which had its armament strengthened by three additional MG 131s. However, this version also saw only limited production. From 1943 until the end of the war production of the Ju 290 was also undertaken at the Letov facilities in Czechoslovakia. Altogether, a total of 23 Ju 290s were built in 1943.

The A-4 variant followed the small production run of Ju 290 A-3s, and differed only in detail, being primarily an interim step to the A-5. The A-5 prototype first flew at the end of November 1943. This was Werknr. 2900170, registration KR+LA. Testing went so well that production was ordered to immediately begin at Letov. The A-5 had its armament increased even more: the B 1 and B 2 gunner's stations atop the fuselage were fitted with flat-profile turrets and MG 151s, the fuselage gondola beneath the cockpit was given a forward-firing MG 151 and a rear-firing MG 131. In addition, there were the waist guns. These were covered with small windows which were raised once the aircraft had reached its operating area. At the same time, deflector flaps were extended from the fuselage sides to reduce the airflow.

The main fuel tanks in the fuselage were reinforced. Pilot seats now became almost fully armored and offered protection against calibers up to 2 cm. The increase in armament meant that the number of crewmen was raised to nine. A significant improvement was the fitting of a fuel dump, similar to that of the Ju 88, whereby the entire load of fuel could be dumped in a short time when there was danger of fire. The most important piece of radar equipment was the FuG 200 Hohentwiel, which had proved to be quite successful when used as a surface search system on the Fw 200 C.

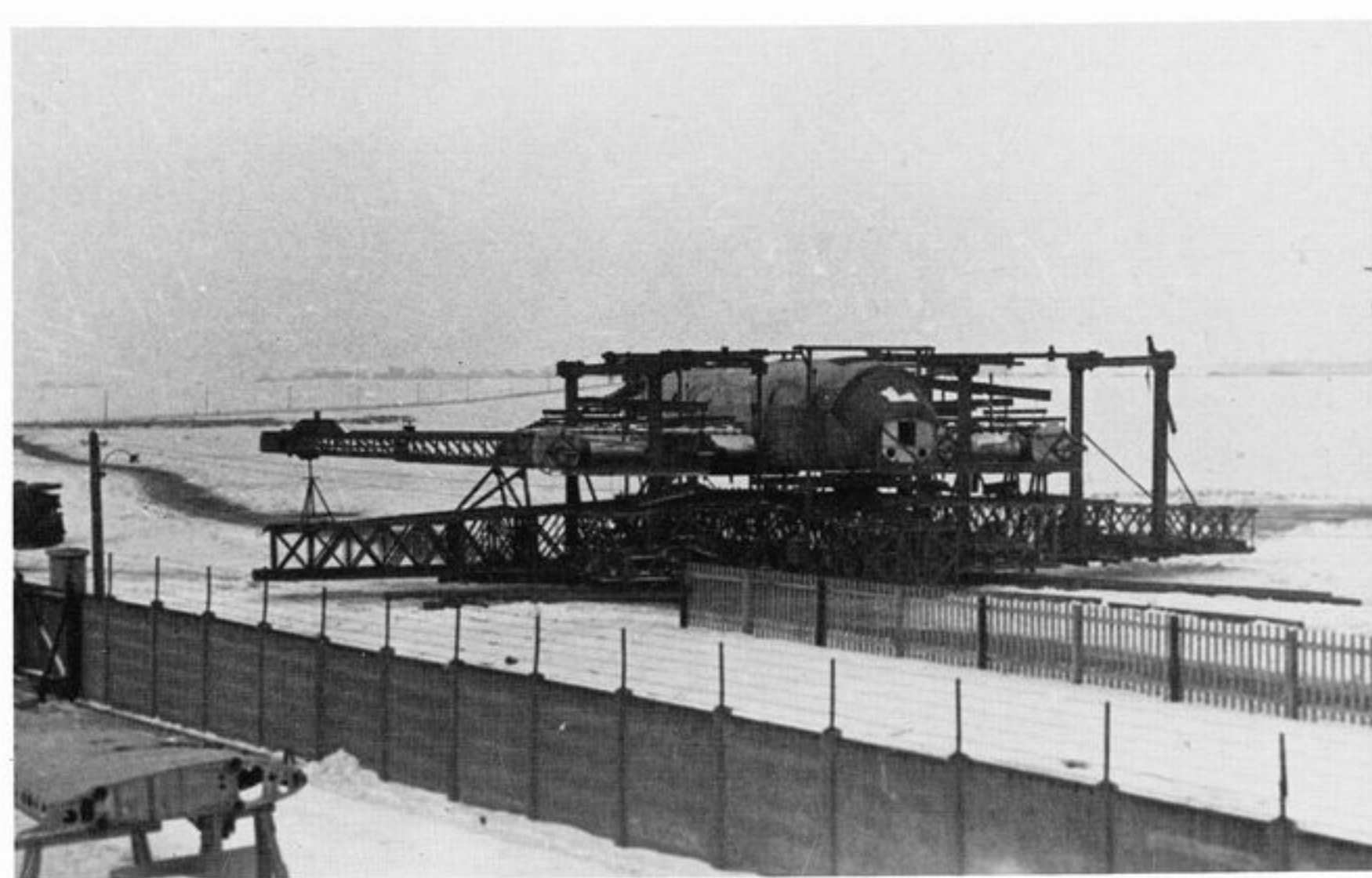


*Ju 290 A  
Arrangement of landing gear and doors.*

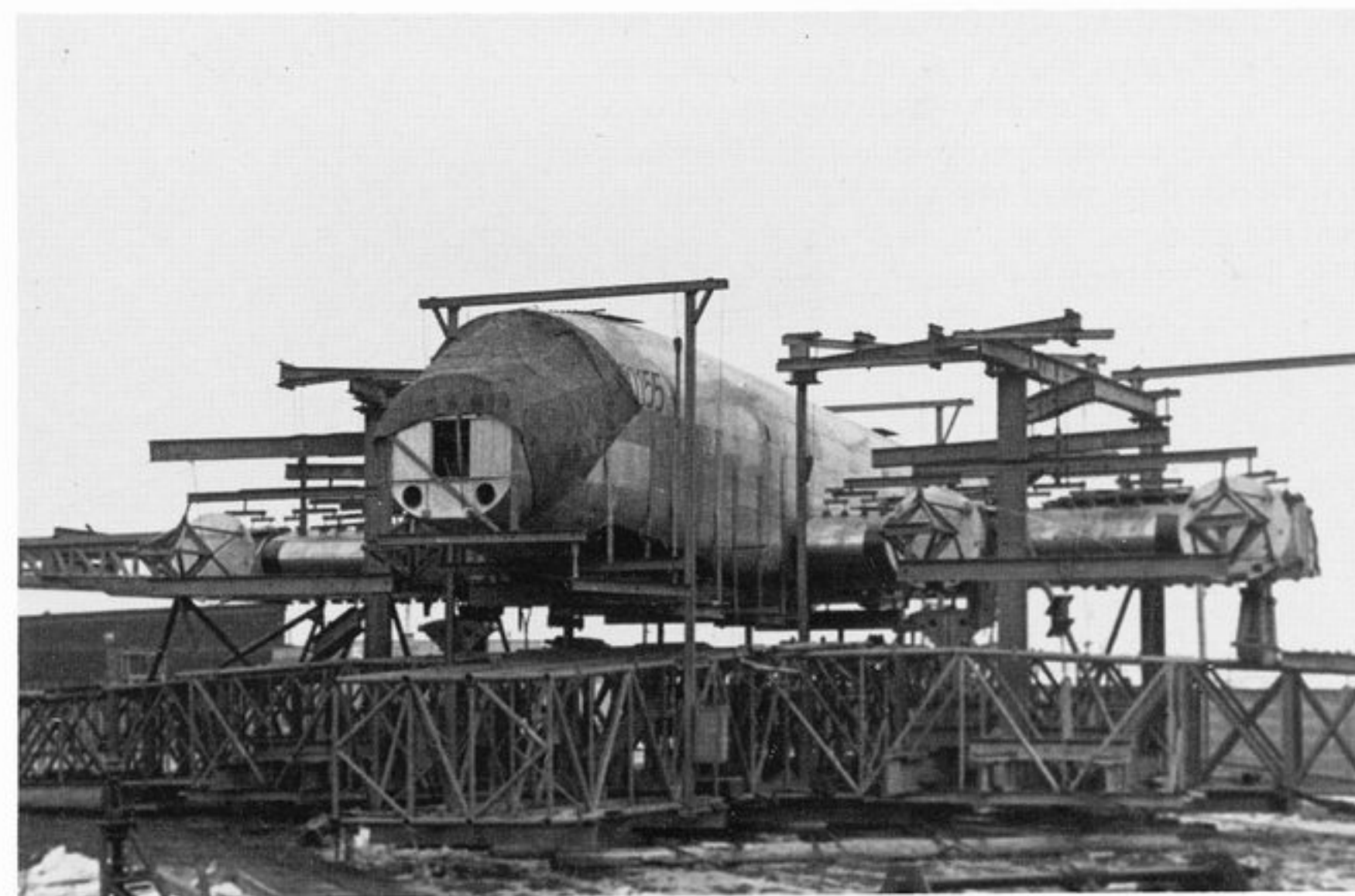




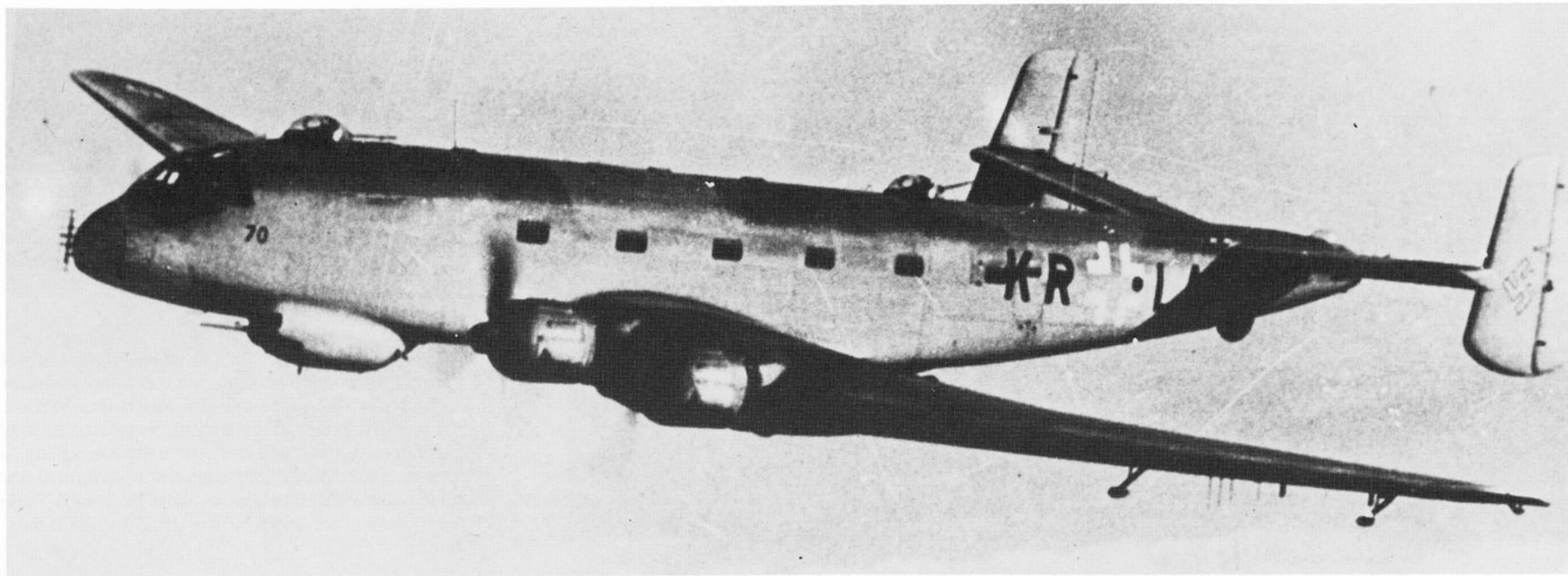
*Assembling a Ju 290's landing gear at Letov.*



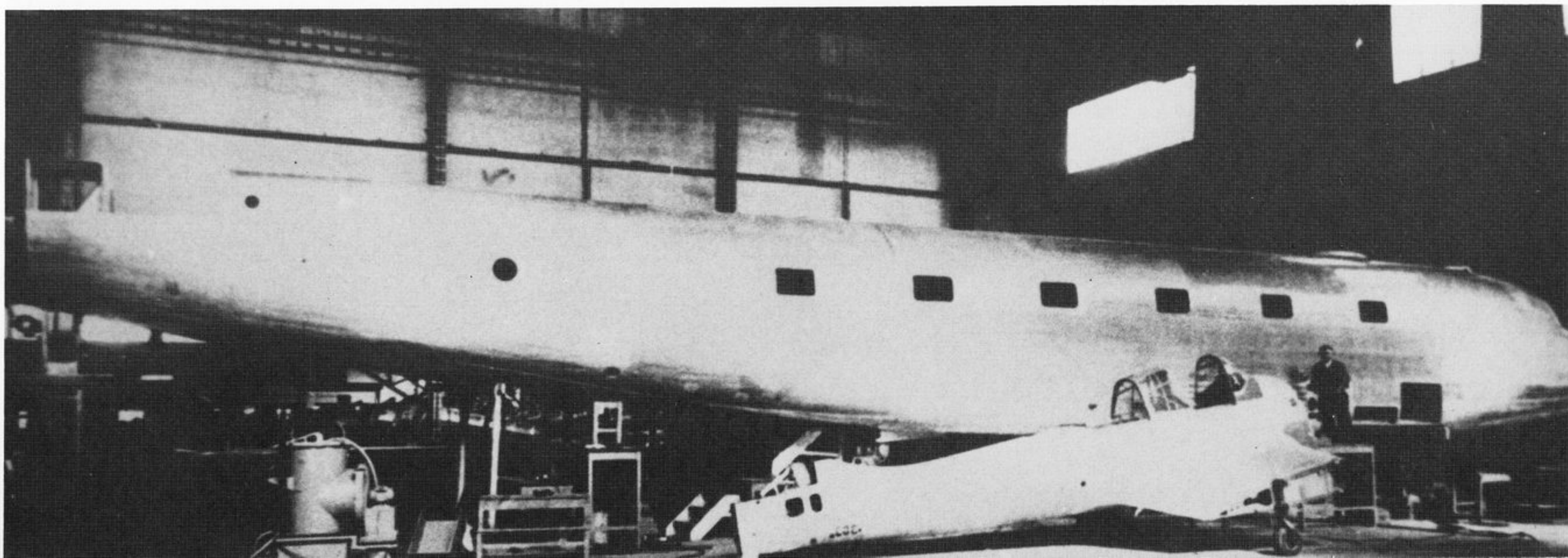
*Ju 290 fuselage stress and temperature evaluation at Letov.*







*Above: Ju 290 A-5, Werknr. 2900170, registration KR+LA, was the first airplane of the A-5 series. First flight in November of 1943.  
Below: Ju 290 A-5 fuselage at Letov. In the foreground is that of a Ju 87.*

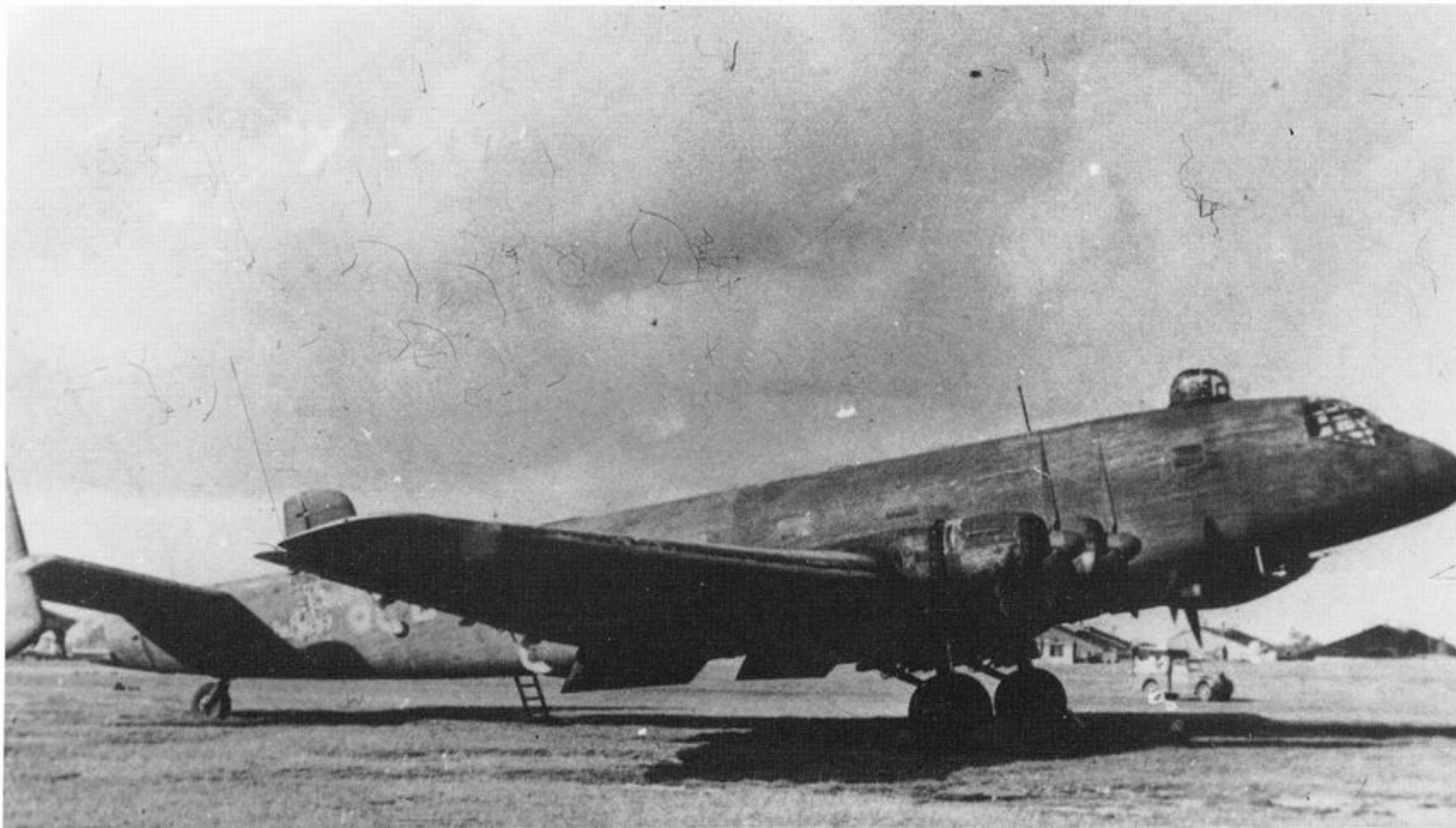






*Above: Belly landing of a Ju 290 A-1 on the Eastern Front.*

*Below: Ju 290 A-3, Werknr. 290161, ex SB+QK, at the Farnborough war prize exhibition in 1946.*

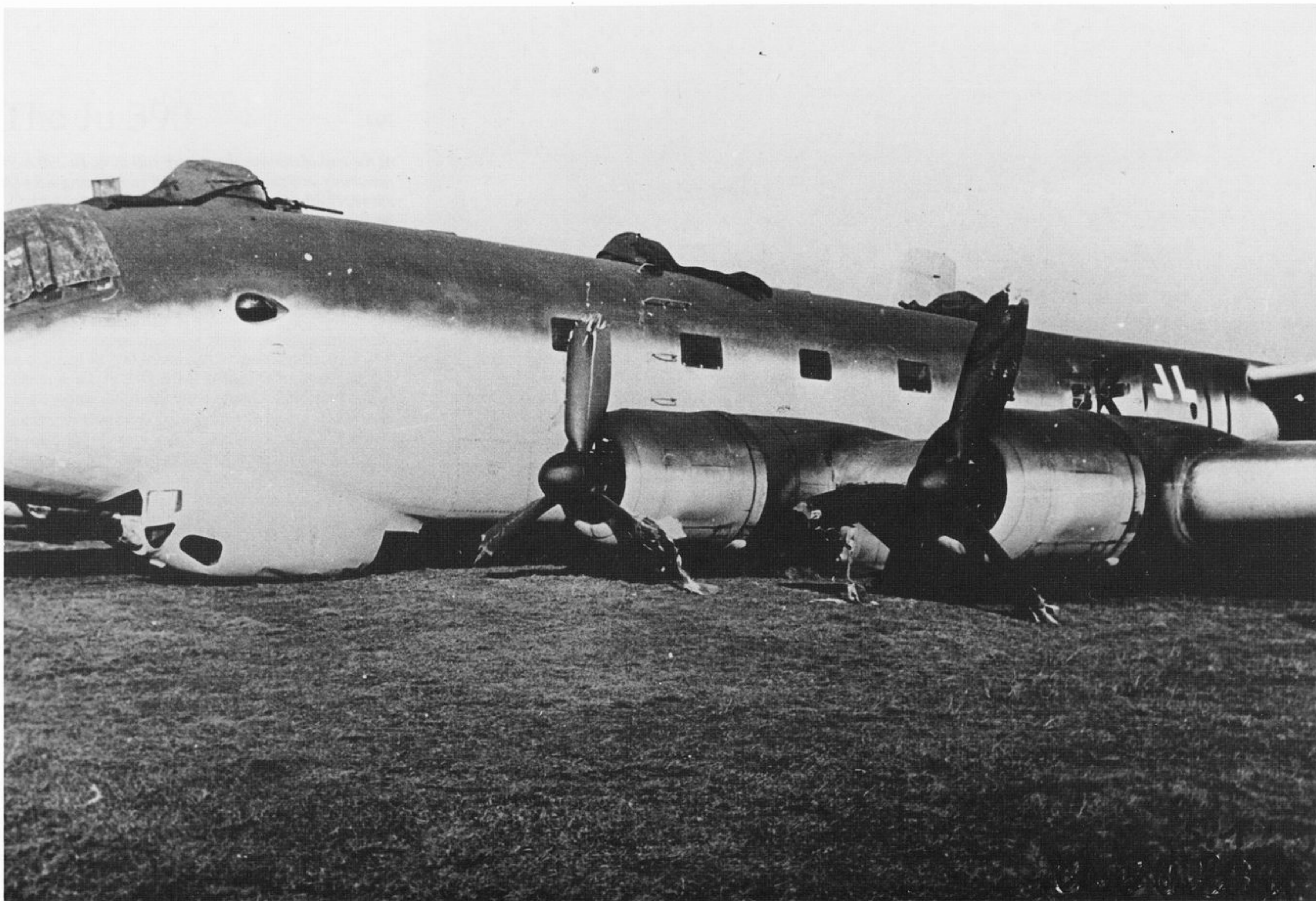


FAG 5 received the first Ju 290 A-5s and was able to accomplish their long-range reconnaissance mission better with this type than with the Fw 200 C. The results of their reconnaissance were outstanding, but couldn't be fully exploited due to a shortage of adequate strike aircraft in the Luftwaffe and warships in the Kriegsmarine. Only around 10 percent of the targets reconnoitered by FAG 5 were destroyed.

In 1944 a transport version of the A-5 appeared, the A-6 (KR+LP), but this was handed over to the Spanish Air Force. This lone A-6 was followed by the A-7 variant, the prototype for which was Werknr. 2900186 (KR+LL). This aircraft completed its first flight in early 1944, and was eventually converted to a long-range bomber and reconnaissance platform. It was fitted with two ETC 500 racks under the wings. These were planned for use with the Hs 293 glide bombs. During testing, the first Ju 290 A-7 crash landed on 1 April 1944.

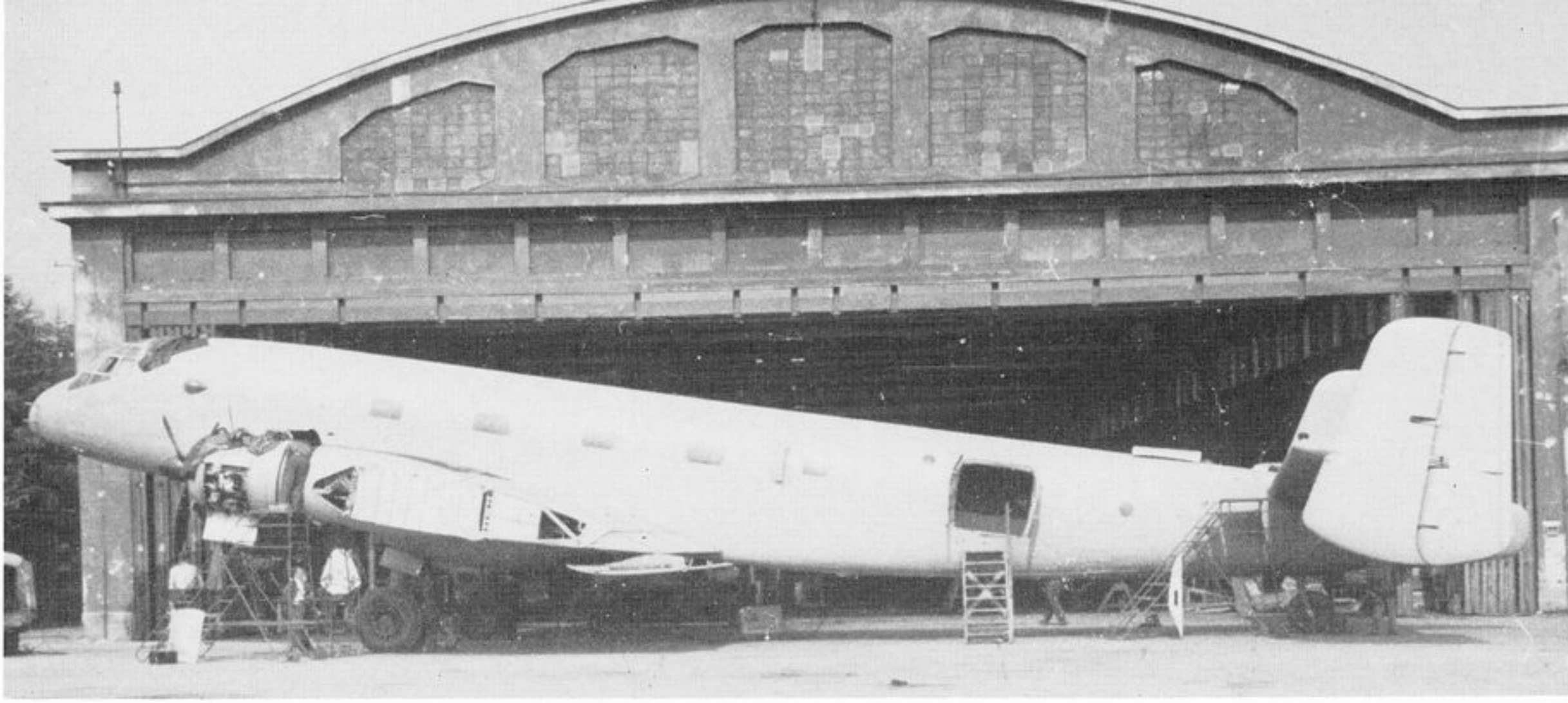
Altogether 26 Ju 290 A-7s were contracted for, but only a few had been built by the war's end. In 1944 only 18 Ju 290s, mostly A-5 variants, were delivered. In Dessau, work was being done at this time on the prototype of the improved B-series. Neither this, nor the Ju 290s still contracted for were built, since in autumn 1944 construction was stopped on all multi-engined aircraft in favor of the emergency fighter program. Even the planned high-altitude transport and long-range bomber ended on the drawing table. The final version of the Ju 290 was to have been the Ju 290 E high-altitude night bomber, but this never came to fruition.





*The first Ju 290 A-7, Werknr. 2900181, KR+LL, was delivered in early 1944 and by 1 April 1944 had already crash-landed.*

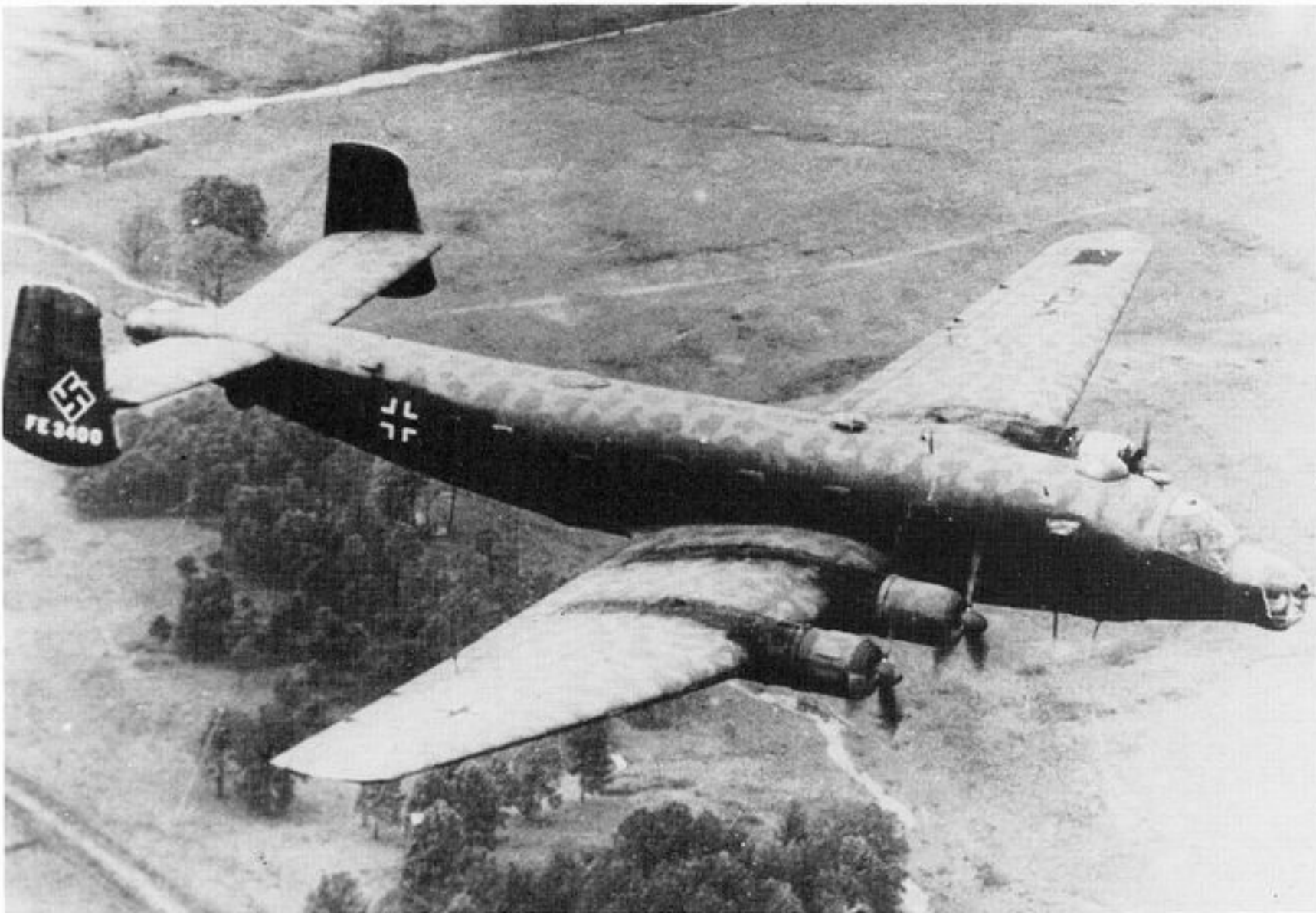




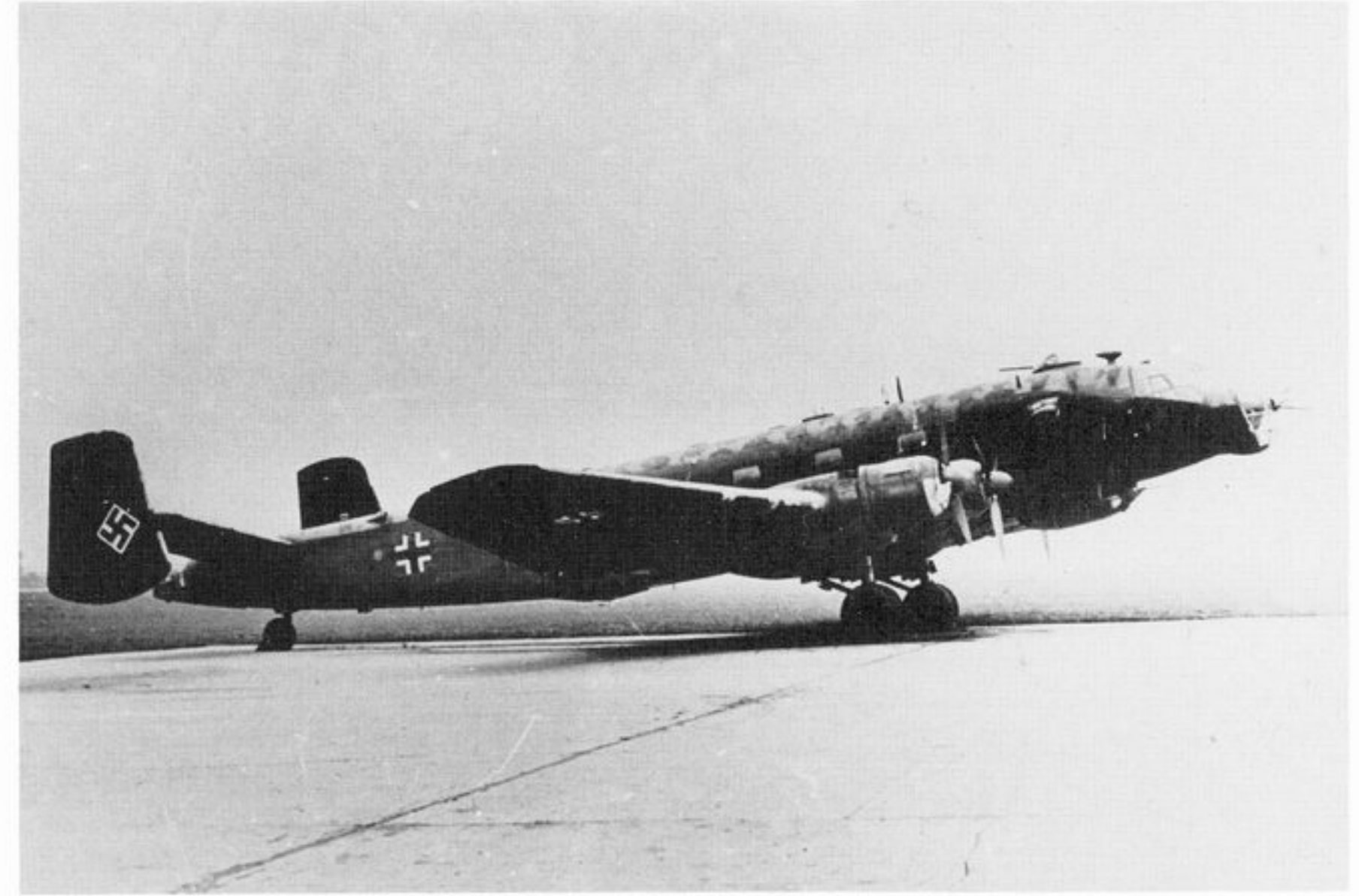
*P44:*

*At the end of the war there were still three Ju 290 A-9s remaining in Prague, registration codes being KR+LM, KR+LN and KR+LO. Some of these were victims of combat, others were rebuilt by the Czechs and publicly presented as the Letov L-290 Orel (Eagle). In addition, a single Ju 290 A-8, Werknr. 29010212 was under construction in 1945. It is not known what happened to the last of Letov's Ju 290s.*

*Ju 290 A built by Letov and after the war officially presented as the Letov L.290 Orel (Eagle).*



*Captured Ju 290 A-7, FE 3400, during testing by the US Army Air Force.*



*Ju 290 A-7, FE 3400, formerly PJ+PS, Werknr. 2900196 was flown to the United States by a German crew.*



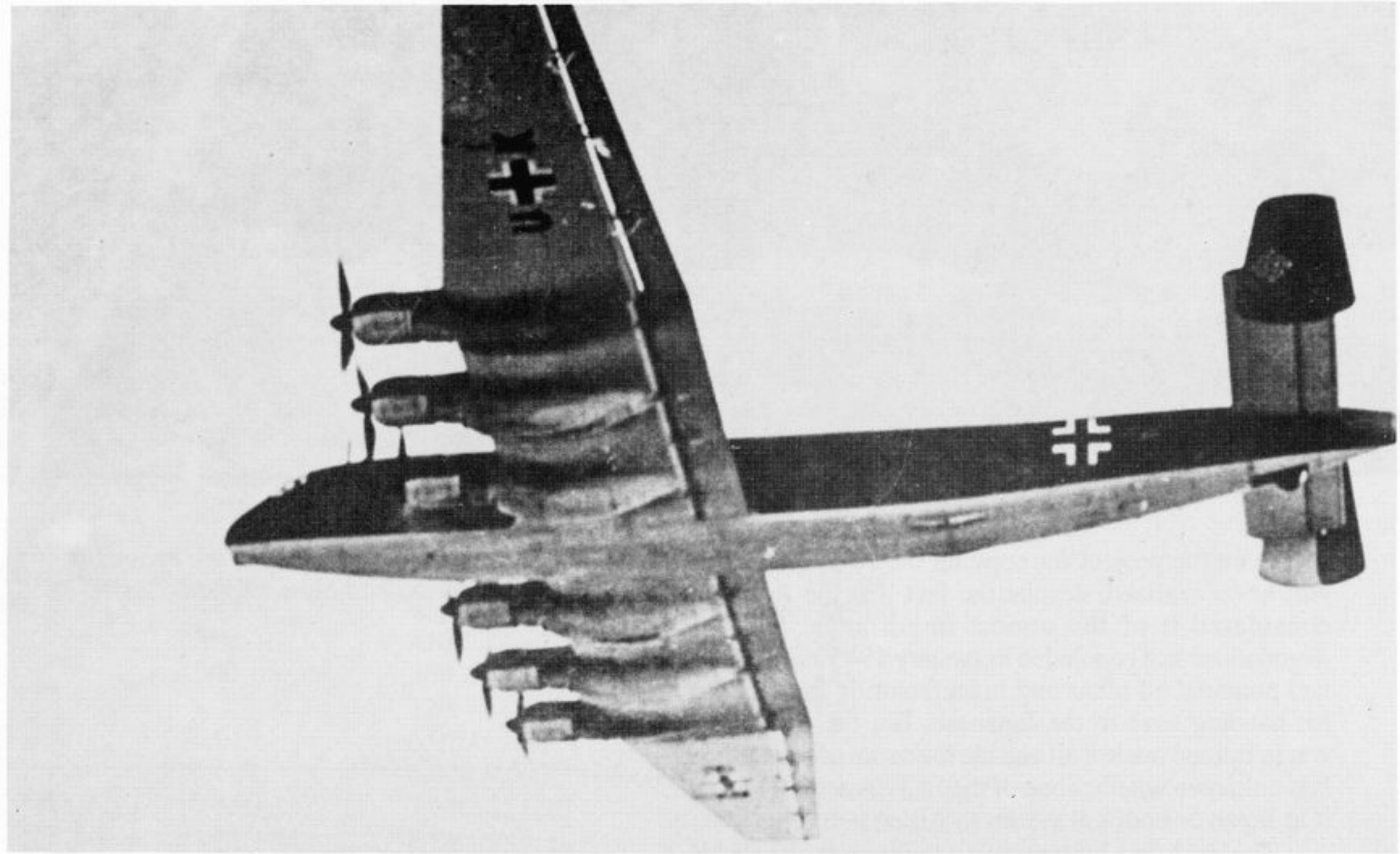
# The Ju 390

Back in 1942 Junkers took part in a competition which the Technisches Amt (GL/C) issued calling for a long range bomber capable of striking targets in the US, primarily New York. Other competitors were Heinkel with its He 274 and 277, Messerschmitt with its Me 264 and Tank with the Ta 400 and Projects 0310224.30 and 0310225.

Junkers chose the most simple path: an enlarged, six-engined Ju 290 based on the mechanical assembly technique the Ju 390. Since this solution required the least amount of production goods and machinery, Junkers was issued a contract for two prototypes. Since the majority of components for their construction came from elements of the Ju 90 and Ju 290, the first flight of the Ju 390 took place as early as 1943.

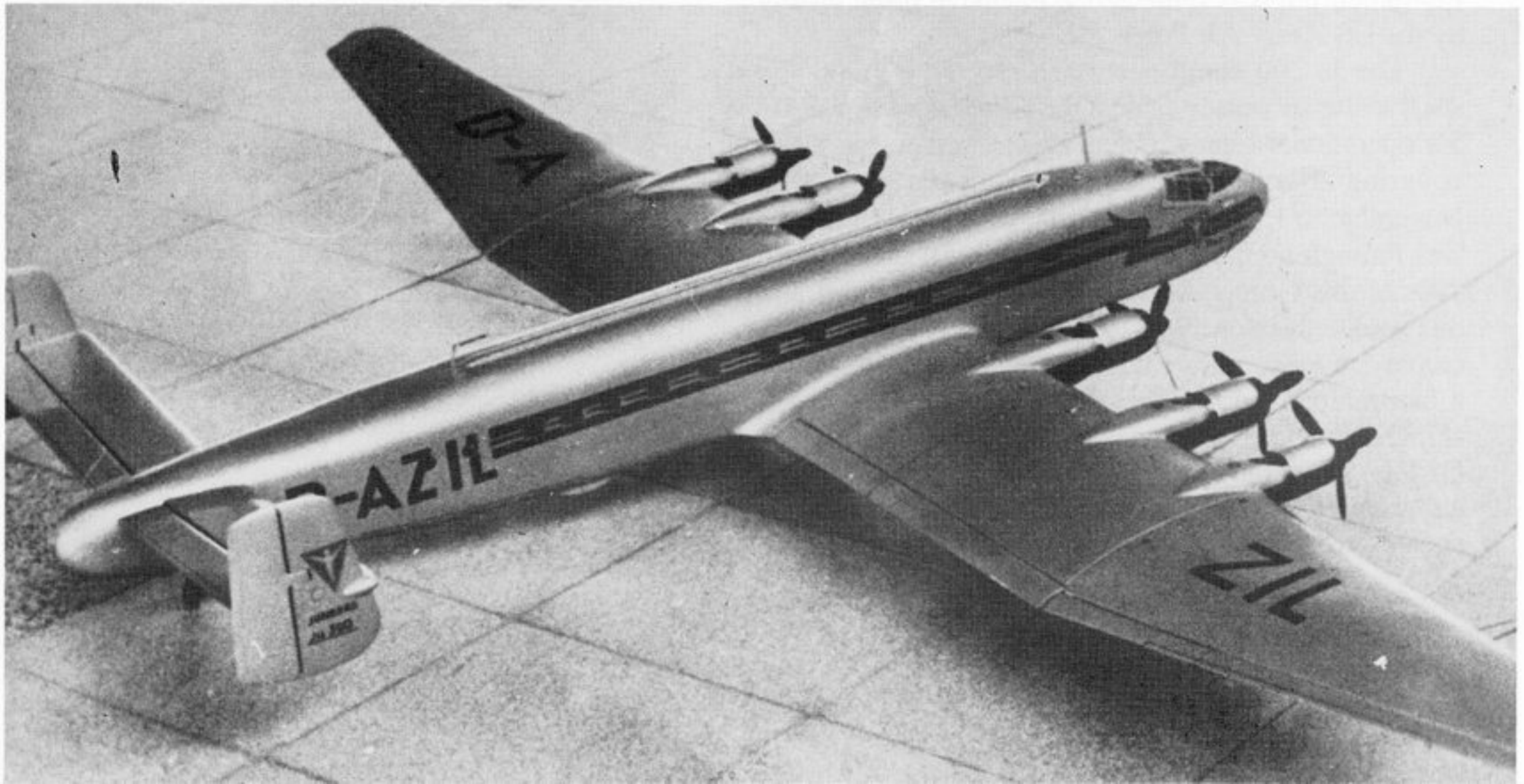
Not only was the Luftwaffe interested, but also Lufthansa which was already thinking of a postwar transatlantic air transport service and later Japan. In Japan, the aircraft was considered for its potential for striking America's western coast from Japan, since Japanese plans for such aircraft were still in the early project stages.

Lufthansa had vainly hoped that Junkers' EF 100 project from 1940/41 would bear fruit. This aircraft was planned for three range categories: 4,000, 6,000 and 9,000 kilometers. These enormous ranges, with a load of up to 100 passengers, were to have been achieved with the aid of six Jumo 223 diesel engines, each with an output of 2,500 hp starting power. This project remained in the wind tunnel testing stages. The Ju 390, therefore, appeared to be an alternate solution. A display model with the registration D-AZIL was even built. But this was where it stopped. After the war, the model was displayed in the departure lounge of the Frankfurt airport.

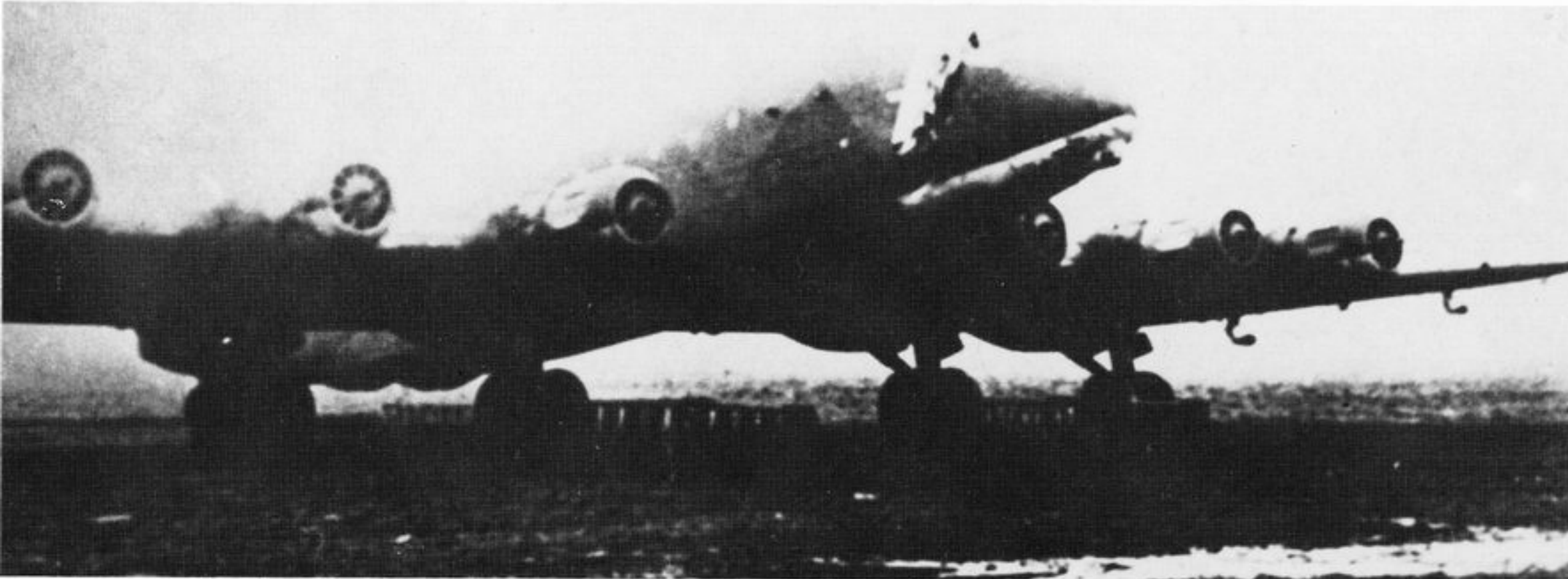


*Above: Ju 390 V 1.*

*Below: Model of the Ju 390 for Lufthansa, D-AZIL.*





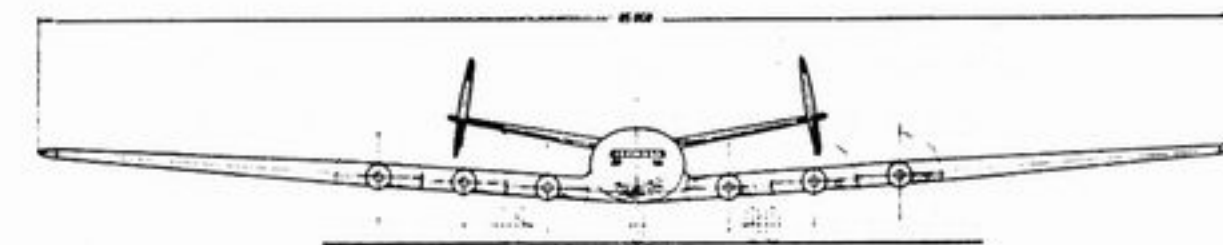
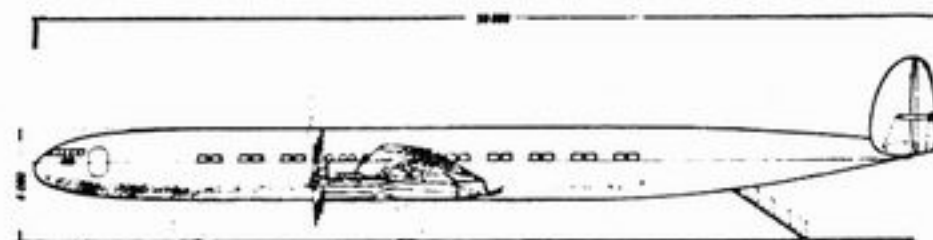


Even the project for copying the Ju 390 in Japan was never realized, despite the fact that the Japanese considered it of the utmost importance. License negotiations had concluded in January 1945 and Junkers had prepared all plans and manufacturing instructions for handing over to the Japanese. But the end of the war in Europe made it all outside the realm of possibility. It is unknown whether one of the Ju 390s actually made it to Japan or both fell victim to Allied bombing.

The last heavy lift transport which was built appears to have been Ju 290 A-7, Werknr. 29010196, registration PJ+PS. After the war, a German crew flew this plane to the US where it was registered as FE 3400 (FE = Foreign Equipment). It was subjected to intensive flight testing by the US Army Air Force.

The Ju 290 could never achieve the Fw 200 C's spectacular successes against the Allied convoys. FAG 5's operational report, dated 15 December 1943 and covering Atlantic operations during the period 15 November to 15 December of that year, shows that this was through no inherent fault with the Ju 290. The Ju 290s of this Gruppe flew 29 operational missions and one rescue mission. Within an eleven-day period, six convoys were monitored, totaling 238 merchant ships, a battleship, 10 destroyers, 9 corvettes and 20 patrol ships. Estimated total tonnage was 1.7 to 2 million BRT. Of this, II/KG 40 was able to sink 18,000 BRT. The submarines directed to these convoys met with no success whatsoever.

*The Ju 390 V 2 mothballed after the heavy lift transport program had been stopped.*



#### Fernverkehrsflugzeug EF 100

$F = 380 \text{ m}^2, b = 65 \text{ m},$

$$\frac{b^2}{F} = 11,1$$

Motoren: 6 x Jumo 223

8 Mann Besatzung

Fluggäste 50

Reisehöhe km 9

R ohne Gegenwind km 9.000

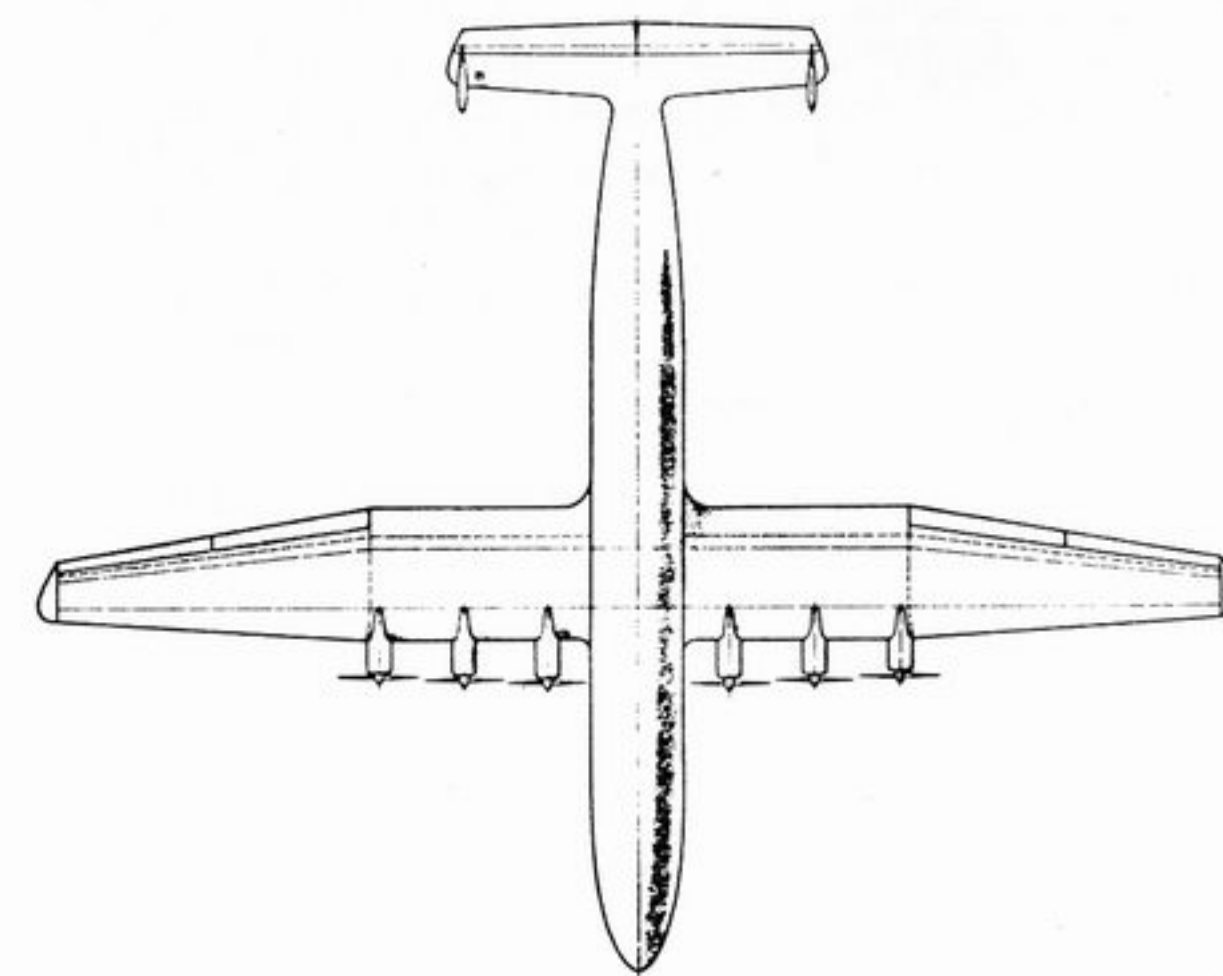
R mit 90 km/h Gegenwind km 7.500

Abfluggewicht kg 81.000

V Reise km/h 500

V max km/h 550

*Druck-  
chem. Werk-  
stoffe*





# Technical Data

Type role	G 38 commercial airliner	Ju 89 bomber	Ju 90 B commercial airliner	Ju 290 A-1 reconnaissance transport	Ju 290 A-7 long-range patrol	Ju 390 bomber long- range patrol	EF 100 transport
crew	7/34	9	4/40	5-6	9	10	6/75
engine	Jumo 204	DB 600 A	BMW 132 H	BMW 801 D	BMW 801 E	BMW 801 D	Jumo 223
performance(hp)	4x750	4x960	4x750	4x1,700	4x1,700	6x2,000	6x2,500
wingspan(m)	44.0	35.27	35.0	42.0	42.0	50.32	65.0
length(m)	23.20	26.50	26.50	28.20	28.64	29.15	49.80
height(m)	7.20	7.61	7.50	6.83	6.83	-	9.0
wing area(m <sup>2</sup> )	305	164	184	205.30	204	254.30	350
weight(empty, kg)	14,900	16,980	14,300	31,155	33,000	-	44,200
weight(gross, kg)	24,000	27,800	24,000	41,090	45,400	67,500-73,000	74,500
max. speed (km/h)	225	386	310	350	410	450	570
cruising speed (km/h)	210	312	290	340	360	347	545
landing speed (km/h)	95	110	109	-	120	-	122
ceiling (m)	5,500	7,000	4,900	6,010	6,010 6,000	12,300	
range (km)	1,900	2,980	2,000	5,600	6,000 8,000	6,000	
armament	-	-	-	2 MG 151 4 MG 81 1 MG 15	7 MG 151/20 1 MG 131	-	-



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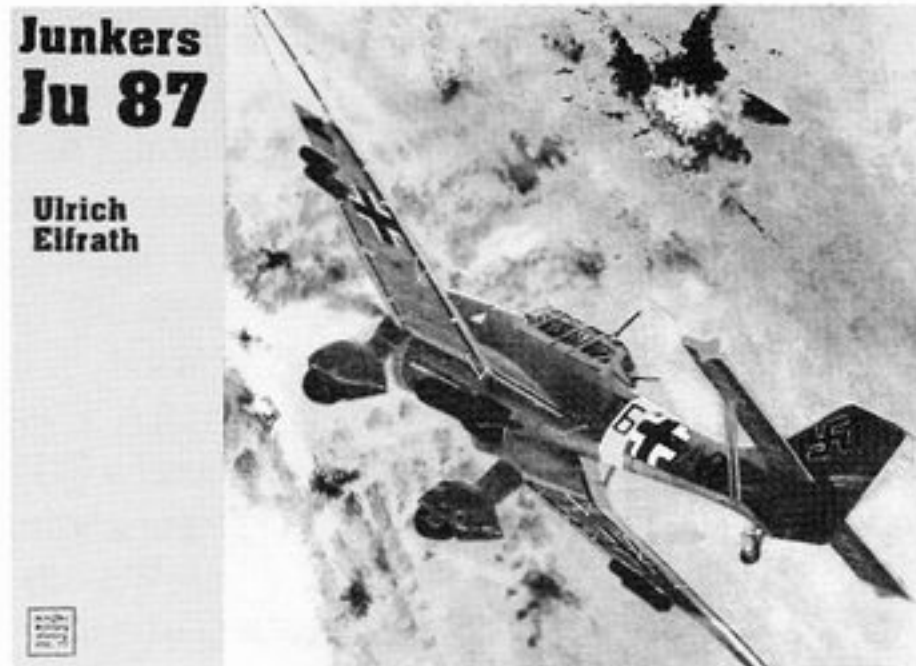
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## MESSERSCHMITT Me 262

Vol. II



The World's First Turbojet Fighter  
Manfred Griehl

## MESSERSCHMITT Bf 109

1936-1945



Heinz J. Nowarra

The Bf 109 E (top) of Hans-Joachim Marseille  
of the 27 (Jagd) and the Bf 109 F of Adolf  
Galland of the 26 (Jagd).

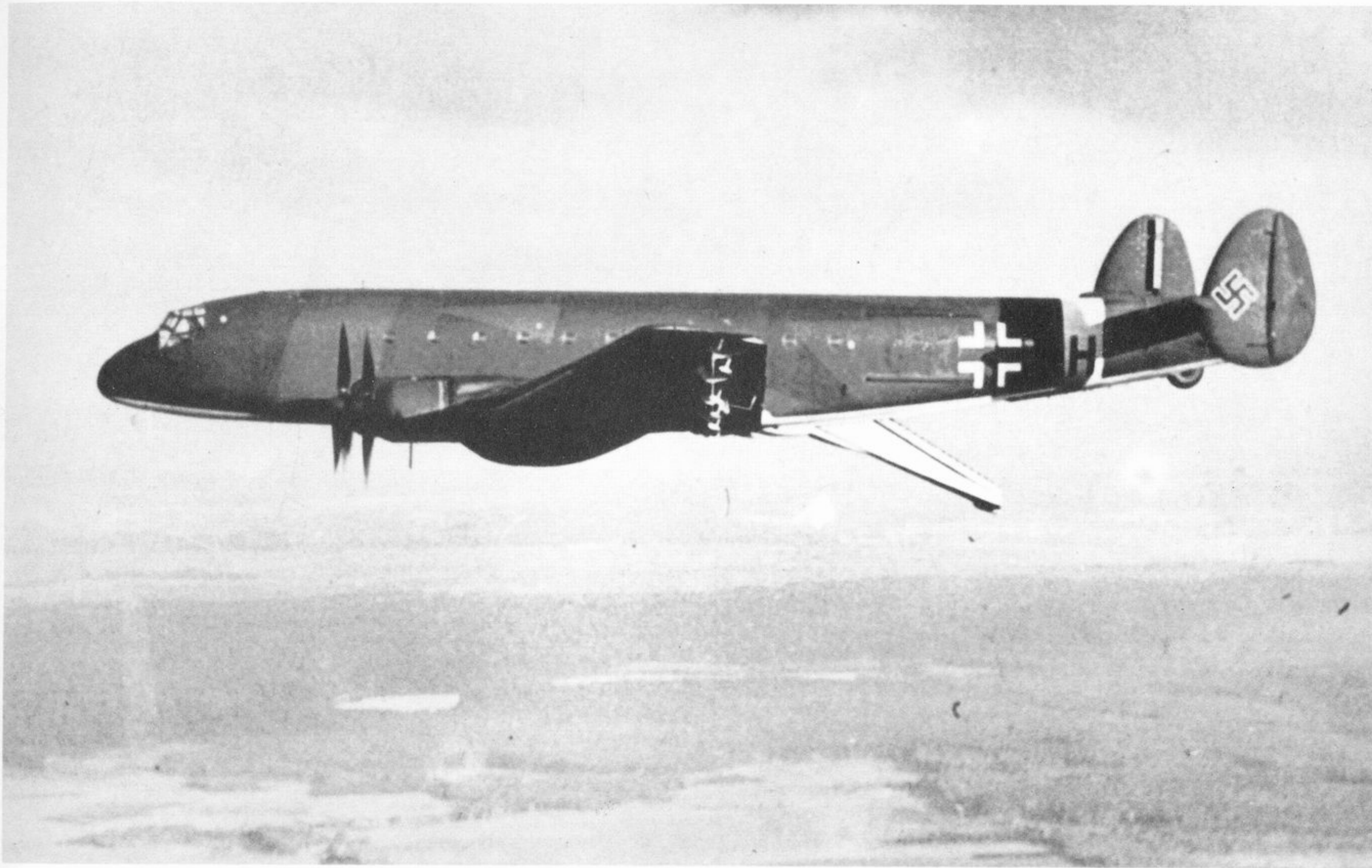


## Ju 88

OVER ALL FRONTS

Joachim Stein

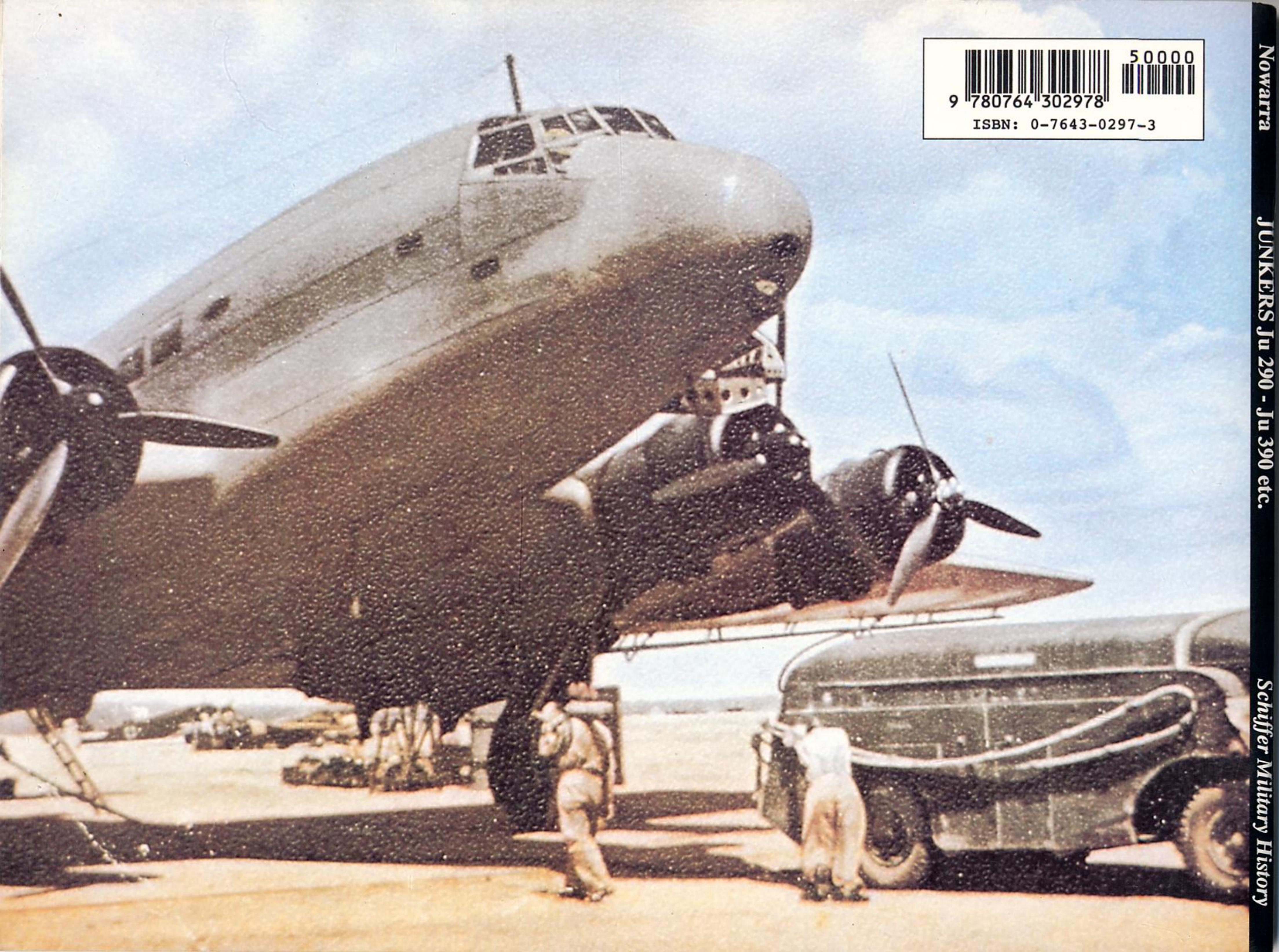




*Junkers Ju 90 V 7, GF+GH, during cargo airdrop testing. Up to and including Ju 290 A-3 all aircraft had the standard paint scheme of 70/71/65 (dunkelgrün-schwarzgrün-horizontblau)*

*Rear cover: One of Lufthansa's first Ju 90 B models, utilized by the Luftwaffe as a transport in Norway.*





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